The Builder.

No. CCCLXXI.

SATURDAY, MARCH 16, 1850.

WHEN Mr. Roberts read his essay on the "Dwellings of the Labouring Classes," reported in our journal, he mentioned that the hollow tiles used in the construction of the roofs and floors of the Streatham-street Model Houses for Families were passed free of duty by the supervisor, on the ground of their being roof and floor tiles, and not intended to be used in the construction of walls. A few days after this statement had been made, an officer from the Board of Excise called on him for some explanation, and was referred to the clause in the Act 2 & 3 Vict., cap. 24, which specially exempts roof-tiles from duty; the board have, however, decided, not only that they are liable to duty as bricks, but that double duty shall be charged on account of the external dimensions, cubing to more than 150 inches, although the actual cubical contents of clay are less than 140 inches. Such a decision appears to be in direct opposition to the Act, which provides explicitly for ascertaining the cubical contents of bricks, where any doubt may arise as to the rate of duty to which they are subject, and explicitly states that it shall be decided by pressing the clay into a mould 10 inches long, 3 inches thick, and 5 inches wide; and if the clay is not more than sufficient to fill such mould, "the bricks shall be taken to be bricks not exceeding 150 cubic inches, and subject to the lower rate of duty."

The essay has since been published,* and the author has appended to it the foregoing statement with the following remarks:—"A more striking proof of the injurious effect of this impost, as well as of the present system of levying it, can scarcely be instanced. The use of a mode of construction calculated to prove generally beneficial, as securing the important advantages of rendering roofs and floors fire-proof, sound-proof, and water-proof, with a degree of lightness otherwise unobtainable, is thus likely to be impeded, and the dwellings of the lower classes deprived of the benefit which would result from the general adoption of a system calculated to add essentially to the comfort and durability, not only of the lowest, but of the highest class of buildings."

He continues:—"The duty on bricks, levied according to the letter of the Act, offers a sufficient barrier to the exercise of inventive skill, in turning to the best account a material which Providence has placed so largely at the command of the architect for the benefit of his fellow creatures; but when double imposts are levied where the law does not enact them, he cannot but sigh for the legislative adoption of free-trade principles in reference to articles of home produce and manufacture, as well as in those of foreign growth and produce."

A committee of the "Metropolitan Sanitary Association," appointed to inquire into the condition of the houses of the poor, the causes of that condition, and to suggest a remedy, have reported—

"First—That the Building Acts passed since 1774 have had the effect of injuriously limiting the size of the houses, and have consequently been a chief cause of the confined and miserable dwellings of the humbler classes in the metropolis.

Secondly—That the health of the people is greatly dependent on an ample supply of light and air, and that the window tax has had a tendency to diminish that supply, and to cause the erection of badly lighted and imperfectly ventilated houses.

Thirdly—That the brick and timber duties have caused the dwellings of the poor to be constructed of bad materials, the tax payable on bricks having compelled the makers to bring into use those which would otherwise have been thrown aside as worthless, and the duty on timber having favoured the use of that kind most subject to decay.

Fourthly—That the present state of the law, with reference to the transfer of land and buildings, has encouraged the practice of land being let on building leases, instead of being sold, which, in addition to other inconveniences, has caused the erection of houses defective in construction, and therefore prejudicial to the health of the inhabitants."

This is beginning at the right end: to ask for legislative enactments to remedy evils, while the causes which produced these evils are left in operation, would be farcical.

We should be glad to see a petition against these injurious taxes from the Royal Institute of British Architects. The Liverpool Architectural Society have just now set them the example. Their petition sets forth,—

"That the duty upon bricks tends materially to retard improvements in their manufacture, operates against the sanitary measures at present engaging the attention of municipal bodies throughout the country, and is especially severe on the industrious classes of the community.

That the window-tax is unequal in its operation, and materially affects beauty of design and commodious arrangement, limiting the skilful distribution of light and air in the dwellings of all classes.

That by the imposition of these duties the progress of architecture in the track of civilization and refinement, in which your petitioners are deeply interested, is obstructed, while their repeal would be hailed as a great boon by all classes as conducive to the best interests of the kingdom."

It appears that the amount of duty collected upon bricks during the year 1849 is shown to have been 448,826*l.* 19s. 3½d., of which 422,812*l.* 18s. 8½d. is for the country, and 26,014*l.* 0s. 7d. for London.

For this comparatively small sum the poor are badly lodged, the community are taxed to double that amount, industry is checked, and architecture injured. The recent vote of the House of Commons against the duty on timber for shipbuilding, as well as the discussion on Mr. Hume's motion, shows a disposition to give industry fair play, and we do most sincerely hope that the Chancellor of the Exchequer will speedily give evidence that he, too, feels properly the importance of such a course.

The brick duties and the window duties must be abolished before any great real advance will be made in sanitary improvement.

Good health, good order, morality, love of the beautiful and the delight it gives, would all be furthered by this step. The window tax and the brick duty conspire against the happiness and progress of society, and help to fill our hospitals and prisons. Away with them, at once and for ever!

"There's a cry from kennel streets,
Where the poisoned air completes
Social ill and moral blight;
If ye would not fill our gaols
Out of crimes which such entails,
'Shut not out the Light.'

Light belongs to man and woman,
God hath made the blessing common,
So to cheer the heart and sight;
Yet a cry from roof to basement,
Comes from many a darkened casement,
'Shut not out the Light.'"

Measures of real importance for the improvement and adornment of the metropolis proceed but slowly. There has been more talk than work; advantage has not been taken of the tide in favour of improvement, and if its friends now relax their efforts, it will turn, and their object will be deferred. "Custom soon melts off the wings which Novelty alone lent to Benevolence."

The formation of new streets in the City goes on slowly and badly. One of several correspondents on the subject says,—"Your recent remarks on the state of the new Houses of Parliament would apply to the City improvements. I was perfectly astonished the other day when in the City, to witness such a picture of idleness; no wonder that the building trade languishes when we see Improvement Committees, as they are called, beginning their work at the middle instead of at the end of the street. No builders in their senses would speculate on such ground as is now offered to be let, without a proper approach to their houses."

The proposal to throw open St. Paul's, ably brought forward, on our suggestion, by Mr. Barber, has been received everywhere with favour. The Aldermen, the Members for the City, and the Sheriffs, will form part of the deputation to the Dean and Chapter.

St. Paul's needs opening in more ways than one. The Chapter may get rid of other *railing* besides that on the outside by abandoning the "two-pence," and re-arranging the scale of fees for visiting the upper parts of this mighty structure. The letters sent to us on this subject are numerous. We will adopt one of them:—

Some time back (says our correspondent) you gave insertion to a communication on the subject of the charge which is at present made for admission to our great cathedral. The obnoxious impost has been condemned by nearly the whole of the metropolitan press, but the dean and chapter have as yet been proof against all remonstrance. The charge in question, it is true, is only twopence, but the smallness of the amount renders the tax still more ridiculous and unnecessary. The cathedral is *essentially* a public edifice, and as such should, like the British Museum, the National Gallery, and the like public exhibitions, be open to the public at large gratuitously. It is notorious that the beautiful cathedrals on the continent are open to the public generally, free of charge, and why should not the same privilege be enjoyed in this country? What must a foreigner think, on presenting himself at St. Paul's Cathedral, to be told that he cannot enter its portals without being subjected to an exaction of twopence? Surely, Sir, it is a standing disgrace to liberal England to tolerate such an exaction! As, therefore, there will be an enormous influx of foreigners from nearly all parts of the habitable globe, in the year '51, to attend the great exhibition of the works of industry, it is to be hoped that the odious impost in review will be entirely abolished. Let it not be said, on their return to their native places, that they were not permitted to enter the sacred and stupendous structure in the heart of the city of London, without first putting their hands in their pockets, and paying the sum of twopence. And then the charge for viewing the various parts of the building is unquestionably most exorbitant. How many poor people from the rural districts of the provinces there are whose means will not enable them to pay 4s. 6d.! I hope you will again lend your aid in extinguishing such obnoxious exactions.

* "The Dwellings of the Labouring Classes, their Arrangement and Construction; illustrated by a reference to the Model Houses of 'the Society for Improving the Condition of the Labouring Classes,' and other Buildings recently erected." With Plans and Elevations. Published at 21, Exeter Hall, Strand.

What has become of "The Society for Opening Public Monuments to the People?" An effort now on their part might be useful.*

EFFECT OF THE WANT OF REALITY ON THE WORKS OF MODERN ARCHITECTS.

AGREEING, as I do, with every word that Mr. Pugin has written in reply to the remarks in the *Rambler*, as quoted in your last leading article, I think the question there entered on so important to architects and architecture in general, that I propose to make a few remarks on the subject.

Were it only one architect that made the complaint, it would not, perhaps, be worth while alluding to it; but every architect of the present day has, I believe, said the same thing in other words, and every building shows evident marks of having been submitted to the pruning process complained of in Mr. Pugin's pamphlet. The *facts*, indeed, of the case, I believe to be universally admitted. The question is, the *causes* of their existence; for there are no facts in the world without causes, or which are intelligible without their antecedents being more or less understood.

To me the cause of all the difficulty appears so self-evident, that the only difficulty is to understand why all the world does not see it as clearly as myself; but they do not, and it is possible, therefore, that I may be mistaken; but, at all events, allow me to try to state my view of the case, and leave others to judge of its correctness or otherwise.

Before descending to particulars I must first try and state the question generally. Anterior to the Reformation in the sixteenth century, architecture in Europe, and in all other countries down to the present day, was a progressive art, in which copying and retrocession were unknown, and decorated construction the elemental formula.

Subsequent to the Reformation a new element was introduced in Europe—that of copying antecedent and dead styles; progress was unknown, retrocession the fashion, and construction generally concealed. Prior to the Reformation, all buildings in Europe—and down to this day in all other countries—are satisfactory, more or less beautiful, and worthy of study. Subsequently to that period none are quite satisfactory in Europe, and all contain falsehoods and deformities, of which we become ashamed as soon as the fluctuating fashion that produced them has passed away.

Lastly, no buildings in the first period show the defects of which Mr. Pugin complains; and neither in the lives of the architects, nor in their works, do we find any evidence of that struggle between the architect and his employer, which he so pathetically deplores. Few buildings since the Reformation do not bear marks of the struggle on their face, and every architect has repeated his complaint.

These premises having been granted, either in whole or in part, it appears to me that they stand to each other in the relation of cause and effect.

To make this more plain, let us try an example. Mr. Pugin complains that in one instance his buttresses were so attenuated as to be ridiculous: this often happens now-a-days, never when Gothic had a true style,—and the reason is obvious. When using a stone roof, or a wooden one composed of immense masses of badly arranged timber, a buttress was requisite to resist the thrust, and being always exactly proportioned to the thrust to be resisted, was always appropriate and beautiful, and no employer could object to what was indispensable. The improvements in carpentry in the present age are such that we can construct roofs of twice the span used in churches, and rest them securely on walls without buttresses, and do so every day. All the world know this, and know, therefore, that they are mere useless adjuncts; and more than this, all the world do not believe them beautiful.

The same is true of pinnacles; it was found necessary to weight walls to enable them to resist thrusts, and because they were necessary they were used and made as ornamental as possible; they are now expensive shams, and therefore objected to.

Mr. Pugin objects to thin walls. It is certain they were not much used in the Middle Ages, because skilled labour was rare; unskilled labour abounded, and it was cheaper to erect a thick mass of rude masonry than a more perfect one of less dimensions. A thick wall is, however, far from being a beauty in the abstract, and certainly is not a convenience. A perfect wall will, I believe, always be found to be one exactly proportioned to the work it has to do, and the durability it is wished to attain; so at least they thought in the Middle Ages, and people now naturally object to the expense of walls thicker than are wanted, merely because a rude people could not build thinner ones.

Arches of brick plastered are, of course, very great abominations; but why use them at all? The question is here the same as before; owing to the thickness of their walls, and the weight of their roofs, our forefathers did not believe brick would suffice to bear them,—so they always used stone in their situation. We know better, and can easily construct brick arches to support our lighter walls and roofs; and the common sense of the world, in consequence, rejects the more expensive material; and so they would have done in the Middle Ages, and did on the shores of the Baltic, and in the valley of the Po; and so architects would do now, if they either knew their own interests, or those of their employers.

But it is needless to multiply examples; let us try and state the question another way. It is proposed to erect a building, say a parish church, to accommodate a certain congregation. This can be done in a common-sense modern edifice, with a sufficient amount of ornament and character, for say 5,000*l*. No, say all the ecclesiologists, archæologists, and amateurs of mediæval antiquities, this can never do; and the architect is made to ask 5,000*l*. more, to put the church into a mediæval dress,—in other words, to crowd the floor with pillars, which prevent people from seeing and hearing,—to abolish galleries, which accommodate crowds at a small expense; to deepen the chancel, so that the clergyman's voice cannot be heard, &c. &c. All this people might not object to, because it is fashionable; but when the *argumentum ad pecuniam* comes in aid of common sense, then commences the struggle, and the congregation naturally say,—if we must masquerade, let us at all events do so at the least possible expense; then comes the docking of pinnacles, the attenuation of walls and buttresses, the plastering of arches, and all those heresies so much deplored; and, if I am not very much mistaken, they always will result when a sham, not truth, is attempted.

The above is as true if applied to Grecian as to Gothic architecture. If an architect gets a commission for a Grecian Doric church, his first idea is a Parthenon: glorious dream! The side colonnades, however, soon vanish; but he may venture to propose a portico in rear as well as in front; but even that is not tolerated: perhaps two or four three-quarter columns? No. Then the inner range of the front portico? No: that too must disappear; so must also the more extensive adjuncts and ornaments; and he is left with a skeleton, of which both he and the public are ashamed. The truth is, the architect wants as many columns as he can get; the public as few as possible, because they are useless, expensive, and inconvenient. Every argument of common sense is against them—"*hinc illæ lachrymæ*"—the struggle between archæology and common sense commences. In nine cases out of ten the former is beaten.

It is not, however, that the public are more niggardly than they were. They never, so far as I can observe, object to pay for what they want, when they are satisfied they are getting full value for their money: but they do object to pay for what they do not want, and will not spend their money in what is not only useless but inconvenient.

Mr. Pugin seems to think that when the public are better informed in matters of art, this state of things will end. The conclusion I have arrived at is diametrically opposed to this; my belief being that as soon as the public are informed as to the processes by which these ancient buildings were erected, they will insist on architects repeating them, if only for an experiment, to try if what is true in everything else may not be true in architecture, that like causes produce like effects. Up to this time no information on the subject has been published, but once the public are as familiar with the modes in which Gothic buildings were produced as they are with the forms, I am very much mistaken if they do not adopt the spirit, and reject the form; and the moment they do, there is an end of all Gothic or pagan reproduction. Architecture will resume her progressive and creative course, and servile copying and retrocession become impossible. J. F.

* Mr. Ewart has given notice that, after Easter, he shall move an address to her Majesty, praying that she may be pleased to take into consideration the expediency of causing our cathedrals and churches to be generally open (so far as is practicable) throughout the day, with a view to encourage the practice of private devotion therein, especially for the benefit of the poorer classes of the community.

ON THE MAUSOLEUM OF HADRIAN, NOW THE FORT ST. ANGELO, AT ROME.*

IT is remarkable how much knowledge of the habits, occupations, and even religion of an ancient people may be gained from the kind of edifices their architects were called to construct. So much is this the case, that, if the pages of history were all blotted out, the dumb monuments, which time has spared, would speak to us of the recreations, the morals, the mode of life, and even the mode of death adopted by the ancient Greeks and Romans. In no age has the architect the choice of the buildings he would erect. His business is to give shape and proportion to the edifices which the climate, the habits, the religion, or the popular pursuits of a people demand. The buildings of ancient Rome, which afforded the most ample scope for architectural skill, would not be required, for instance, in our metropolis. The buildings, which give scope for the architects' skill, the porticoes, theatres, baths, are lost to our time and climate.

It is with special reference to sepulchral monuments that I have introduced these preliminary remarks. These afforded a field for the architect of classic times, which in our day has been entirely transferred to the stone-mason. The pyramids in Egypt, the monument of Philopappus at Athens, and the sepulchres of Augustus and Hadrian at Rome, were among the most conspicuous edifices of their respective countries and ages. But where now should we find a tomb in our public cemeteries or graveyards which would require any skill to construct, beyond what might be found in a very moderate artist. I speak not of the monuments of our great men, which the art of sculpture has touched, and which stand under the shelter of a cathedral vault—*admittance, 6d.; children, half-price.* Speaking, as I intend to do, of sepulchral monuments as buildings, I have yet to ascertain the cause why this class of edifice has been lost to the modern architect. The cause is in the change which Christianity has wrought in the hopes and prospects of what may happen after death. The ancients considered a tomb in a much more important light than we either can or ought to do. So feeble were their expectations of living in their fancied Elysium, that they generally looked forward to the honour of a tomb, as the only blessing that awaited them. Hence the anxiety so frequently discovered on monumental buildings, which the individual, during lifetime, had erected for providing for himself and his family a place of burial free from intrusion. The initials—H. S. F. V., Hoc sibi fecit vivus, "He made this for himself while he was alive"—we constantly find on ancient tombs. And we cannot wonder that the wealthy, under these circumstances, should have bestowed so much of their substance in erecting their private monuments, and the warrior and the statesman so much care and toil in gaining this as a public honour.

The ancient Romans erected their splendid tombs by the sides of the public roads; and from the remains still existing along the Via Appia, that road might, without any further indications, be traced for at least 4 miles from Rome.

The early sepulchres of the Republic at Rome were of that kind called Hypogæa, that is, chambers under ground, with an elevation little more than enough to exhibit the inscrip-

* Read at a meeting of the Architects' Institute, 4th March.

tion to the passers by. Such was the sepulchre of the Scipios, as it is yet to be seen near the Porta St. Sebastiano. But towards the end of the Republic, when the luxury of marble began to be known, and governors of provinces returned home laden with the spoils of the east, the colossal taste in sepulchral monuments was introduced. The rich Crassus erected a mausoleum for his wife on the Via Appia, built of travertine stone, 24 feet thick; and every one who has visited the Campagna of Rome, will be familiar with the striking monument of Cecilia Metella. Forsyth observes, "the general form of the tombs on the Appian Way is a cylinder or a truncated cone with a cubic base and a convex top. This combination," he says, "conveys the idea of a funeral pyre, and has some tendency to the pyramid, the figure most appropriate to a tomb, as representing the earth heaped on a grave, or the stone piled on a military barrow." Perhaps Crassus was the first who broke through this general rule, when he gave more rotundity to his wife's monument. Caius Cestius went back to the pyramid, and these two monuments, which we may consider as belonging to the Republic, have now stood for nearly 2,000 years, and there seems no reason why they should not stand for 2,000 more.

But I come now to the two great sepulchres of Imperial Rome. Augustus chose for the site of his mausoleum a place in the Campus Martius, between the Via Flaminia and the Tyber. The remains of that monument are now to be seen behind the Palazzo Corea, near the Porto di Ripetta. The ancient walls are so concealed or involved with the surrounding buildings that its magnitude can hardly be estimated by the spectator. Strabo has given us some description of it, and he considered it the object most worthy of notice among the splendid edifices of the Campus Martius. It stood upon a lofty substruction of white stone, near the bank of the river, and it was shaded to the very top with evergreen trees. The summit was crowned by the statue of Augustus in bronze: the trees appear to have been planted on the belts of the stories, as the circumference contracted towards the top. Behind the mausoleum there was a grove laid out in walks, the care of which was committed to a procurator. The tomb was built twenty-seven years before the Christian era, and it is probable that the boy Marcellus was the first of the imperial family interred within its walls.

quæ, Tyberine, videbis
Funera, cum tumulum præterlabêre recentem!

It was in this tomb that Agrippa and Drusus were buried. And in the nineteenth year of the Christian era, Agrippina, in the midst of weeping crowds of citizens, brought the ashes of Germanicus to be placed within its walls. But the monument, which was designed by the first master of the Roman world to be the silent repository of the ashes of himself and his posterity, has come to an ignoble end. The ruins, which time and Robert Guiscard the Norman have left, are now consolidated into the platform of an amphitheatre; and in the summer months, several thousands of the Roman people sit round the ample circumference, to witness the horrors of a bull-fight, the feats of horsemanship, and the antics of a vagrant clown.

As if it were to show how little any works, however great, are valued, which have not some public object or utility, the colossal monument of Hadrian, which we are about to view, is hardly noticed by the ancient writers. But there is little doubt that the Emperor Hadrian himself was the architect of his own tomb: the whole of his life was dedicated to the arts, and he could ill brook a rival in the science on which he thought he excelled. Apollodorus, the great architect of that day, the man of taste, was doomed to view all the designs the Emperor sent to him, and to choose between praising what he could not admire, or going into exile. Apollodorus ended in the latter alternative, and left the imperial architect to construct his own mausoleum. Dion Cassius tells us, that when Hadrian was buried in the tomb he built on the bank of the Tyber, that of Augustus was full, and no more ashes could be deposited within it. But I apprehend that Hadrian had cast an emulous eye upon the great work of his predecessor, and perhaps chosen the garden of Domitia, nearly opposite, to confront with greater splendour the monument which Strabo had praised. The rich materials he had probably collected in his travels through the empire, and, I imagine, like those who built a still larger tower in the plains of Shinar, the vain notion of his mind might be expressed in the same language—"Come let us make us a name." Be this as it may, all that Spartian, the biographer of Hadrian, tells us about this stupendous work is, "Fecit et sui nominis pontem et sepulchrum juxta Tyberim." The bridge here mentioned is that which Hadrian erected across the Tyber to give an easy access to his tomb, and which he called Pons Elius, after his prenomen. There is a medal extant, which exhibits this bridge with three main arches in the middle, and at each end two of smaller dimensions. Much of the ancient construction of peperine stone still remains in the vaults of the arches, and with the name changed to Ponte S. Angelo, it preserves to this day the appearance of what it was originally.

It appears from various inscriptions that have been found and preserved, that this mausoleum received the ashes of all the Antonines; and the body of Commodus, after being dragged through the Tyber, was also buried in it by order of Pertinax. Something was left by Hadrian for his successors to finish, and it probably continued to be the imperial place of burial until the time of Septimus Severus; perhaps we may say until the middle of the third century. Then its history as a sepulchre ends. But, before I proceed to describe to you the original appearance and splendour of this monument of imperial Rome, let me bring together the few notices which are found of it in ancient writers. Procopius is the first who gives any description of what it was: in his account of an assault made by the Goths outside the Aurelian gate (it is not far from where the Gauls of 1848 very recently made their assault), he thus writes:—"The tomb of the Emperor Hadrian is situated outside the Porta Aurelia, about a stone's cast from the bulwarks of the city; it is an object worthy of admiration. It is built of Parian marble, and the blocks fit close to one another without any thing between to fasten them; it has four equal sides about a stone's throw in length; it rises above the city walls; on the top are statues of the same kind of marble, admirable figures of men and horses. The men of old time (that is the Romans, probably in the time of Honorius), joined this monument with the bulwarks of the city by two walls, because it appeared to be advantageous for the defence of the city; it thus became a part of the fortifications, and had the appearance of a lofty tower covering the entrance of the city." So far we learn that the mausoleum was converted at a very early period (for Procopius saw it in 534 A.D.) into a fortress. Those beautiful statues, however, which the secretary of Belisarius describes, were put to a strange use by the defenders of Rome. Instead of more appropriate missiles and more raw material, these master pieces of sculpture were torn from their pedestals and hurled upon the besiegers below; and perhaps the breaking of the head of a Goth might cost a whole Venus or a Mars, a head of a Faun, or a foot of Hercules. I do not know what to say of a passage cited by Salmasius from John of Antioch, who lived A.D. 620. "The figure of Hadrian," he says, "stood on the top in a car drawn by four horses, of such colossal dimensions, that a full grown man might pass through one of the horse's eyes." A chronicler of the thirteenth century, commonly called the anonymous, says that the tomb was faced with marble, and he talks of gilded peacocks and a bull. The same mediæval sight-seer mentions also bronze doors and horses, which he saw about the mausoleum. But the earliest representation or drawing we have of the Mole is that now existing on the bronze doors of St. Peter's, made in the days of Pope Eugenius, by Antonio Pollagio, about 1481. In Camucci's sketch, made a century later, some of the cornice is indicated, which he must have seen, and which he says was embellished with ox heads and festoons; and on the frieze there were two inscriptions then to be seen belonging to Commodus and Lucius Verus. Pope Clement VII. and his architect Labacco gave currency to the tradition, that the beautiful columns of Paonazzetto, which stood in St. Paul's Basilica, once adorned the upper stories of this mausoleum. Now with these notices of historians and artists of old time, added to our own observations of its present state, we are to make the description, both external and internal, of this durable monument.*

RICHARD BURGESS, B.D.

TUBULAR GIRDER BRIDGES.

INSTITUTION OF CIVIL ENGINEERS.

ON the 12th, the president in the chair, a paper was read, "On Tubular Girder Bridges," by Mr. Wm. Fairbairn. The author commenced by stating, that the chief points to be taken into consideration were:—1st, the application of a given formula, for computing their strength; 2nd, the excess of strength that should be given, over the greatest load that could be brought upon the bridge; and, 3rd, the effects of impact, with the best mode of testing the strength, and proving the security of the bridge.

In the first place, it had been determined by experiments, that, in order to balance the two resisting forces of tension and compression, in a wrought-iron tubular girder, having a cellular top, the sectional area of the bottom should be to the sectional area of the top, as eleven to twelve; and that until this proportion existed, the usual formula could not be applied; this formula was, that the breaking weight was equal to the total area, multiplied into the depth, and into a constant (80), and divided by the length of the girder. $\left(w = \frac{a\,d\,c}{l}\right)$

Considering the particular case of the Torksey-bridge, the mean sectional areas of the top and the bottom, being respectively 51·08 square inches and 54·93 square inches, the latter was in excess of strength over the former, so that a reduction of the area of the bottom from 54·93 to 46·76 square inches might have been made with propriety, and would have been in conformity with the formula.

By calculation, the ultimate strength of the bridge was found to be 1,152 tons, whilst the greatest total load, including the weight of the girders, &c., was only 372 tons. This gave a strength greater than the heaviest rolling load that could be brought on the bridge, in the proportion of nearly five to one. Although, therefore, the proportion of the girders was not exactly that which the author recommended, he considered that "they were, nevertheless, sufficient to render the bridge perfectly secure." This conclusion was arrived at without taking into consideration the amount of additional strength derived from the continuity of the girders across the central pier.

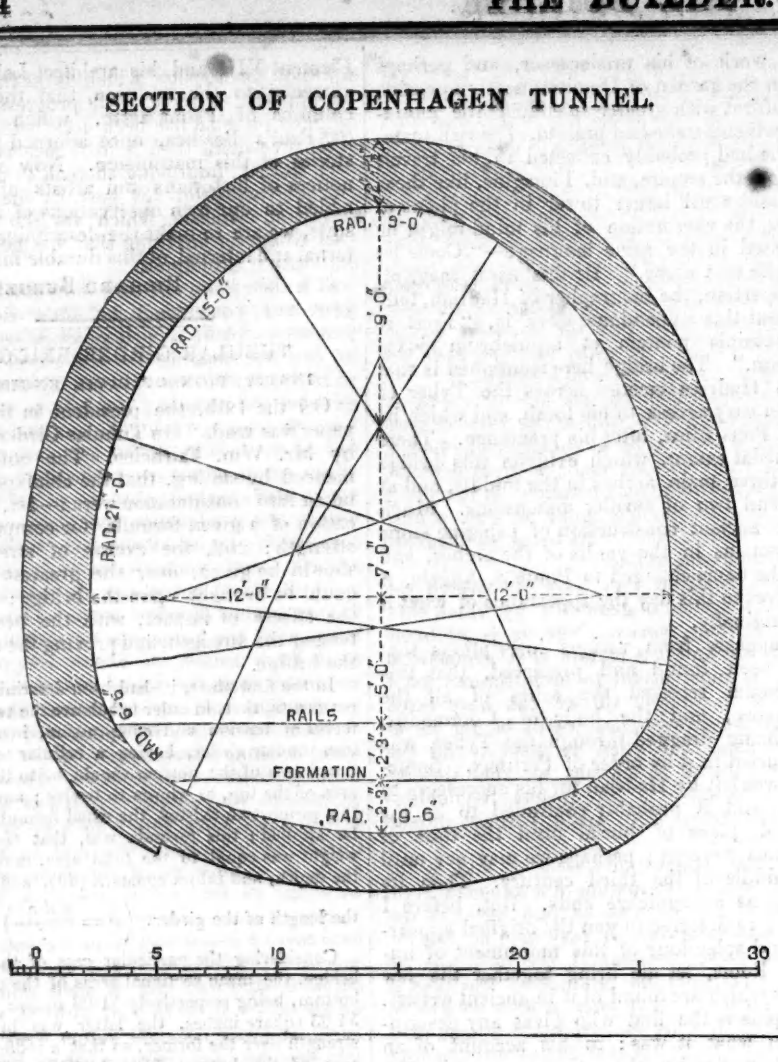
The exact proportions recommended were given in two tables extending respectively to spans of 150 feet and of 300 feet. The depths of the girders of the first class were taken at one-thirteenth of the span, and those of the second class at one-fifteenth of the span.

In the discussion which followed the definite proportions assigned in the paper for girders were disputed, and the attempt to assign empirical rules for the practice of engineers, in structures of this novel character, was earnestly deprecated.

PROVINCIAL.—A market house is to be erected at Cinderford, Forest of Dean, cost payable in 20 shares, of 50*l.* each.——The foundation stone of St. Matthias's Church, on the Weir, says the *Bristol Journal*, was laid on Thursday, in last week. It is to be in the Decorated style, with accommodation for 842 sitters, 634 free, and all with open seats. The architect is Mr. John Norton, and the builders are Messrs. Willcox and Sons, who have contracted to erect the edifice in eighteen months. ——Mr. Macbride, the sculptor, says a Liverpool paper, is engaged on a historical group from British history, to be executed in marble, for the International Exposition.——A number of Mr. Ebenezer Elliott's admirers have expressed a desire that a monument should be erected to his memory in or near Sheffield. ——Resolutions have been passed by the Knaresborough Improvement Act Commissioners, for carrying out a complete plan of drainage in that town. A committee visited Ripon, to pick up a few hints, as the neatness, cleanliness, and healthfulness of that town has been with good reason attributed to the completeness of its drainage: not a single case of cholera occurred in that town.

* To be continued.

SECTION OF COPENHAGEN TUNNEL.



COPENHAGEN TUNNEL.

THE section of this tunnel will be useful to the student, as showing a series of curves throughout. The bricks are set as headers in the invert and sides; and in stretchers, or 4½ inch rings in the smaller curves. Great strength is thought to be obtained by this form, and skew backs are dispensed with. In no portion of the section do the bricks require cutting. The thickness of the brickwork is 2 ft. 7½ in., excepting the bottom, which is 2 ft. 3 in.

"Cement" is not used in this work, but mortar, made as here described:—

MORTAR.

Blue lias lime	5	parts.
Burnt clay or brick rubbish, ground	2	,,
Clean sharp sand	2	,,
Coke ashes	1	,,
	10	

Mixed by measure. The mortar is ground in a pan which revolves under two edge rollers, about 5 feet diameter, and one ton weight each. The pan is driven by steam power.

Messrs. W. and J. Cubitt are the engineers. The contractors are Messrs. Pearce and Smith.

Good mortar is of the utmost importance to the engineer, the architect, and the builder; and a knowledge of the ingredients necessary to compose such will be acceptable to all who wish to construct works of use and permanence. The Romans paid strict attention to the character of the mortar they used; in many instances the strength of their military walls depended entirely upon the strength of the mortar, as there was no bond in the arrangement of the stone. Such was the case in the great wall from Newcastle to Carlisle. Such in a great measure is the character of the masonry of the Liverpool Docks, as now, and for some time past, constructed by Mr. Jesse Hartley, the engineer. The cement called "Roman," was not known to the great builders of that building nation. In the vast dock works at Liverpool, it has not been used, and if good mortar is made and used with proper attention and care, cement of any other kind, as known by the name of "cement," will rarely be required. A mortar which sets gradually but surely, is in every respect to be preferred to a quick-setting and rigid cement. The young engineer or architect must not, however, sit down in idleness and draw up a specification from this, or any other recipe, but carefully analyze his materials, if new, and try by experiment, so as to make certain of adopting the best. There is a wide difference in the character and quantity of lime. The ingredients to combine, and mode of mixing, must be varied to suit each.

PROGRESS IN ARCHITECTURE.

ARCHITECTURE is both a science and an art. It may advance with rapidity in its first capacity, and yet remain stationary or even retrograde, and that without observation, in the second; and thus its health, nay, its life, as an art, may expire, till it sink into a mere craft of building, notwithstanding that the means at its command are far beyond those of any former age. Since the discoveries of the chemist and geologist have been added to its service, the extensive application of iron and the power of steam have increased its resources. And the enterprize of commerce and the present facilities of communication with other countries bring such materials within its reach, as formerly were unprocurable.

As an *art*, architecture is less imitative and more creative than either painting or sculpture; the materials with which it has to deal are too rugged and unyielding to allow of direct imitation; it thus becomes essentially conventional; it works rather with the principles than with the forms of nature; the type of ornament which it has thence chosen must be engrafted upon, and be developed together with, and not conceal, the idea of the stability of its framework; its means of expression also are more limited than those of its sister arts. *Material abstract beauty or sublimity* is its principal scope, and that a wide, noble, and sufficient one, for the limits of its power have not yet been reached by man, nor need it be feared that they will be. *Architecture*, then, in the first instance, may err and has erred from its character as an art, having been subordinated to that of science; for, connected as it is with several lucrative adjuncts, it is seldom embraced, like painting and sculpture, from an ardent love alone, but is coldly and calculatingly entered upon as a respectable profession and lucrative business, and therefore may, indeed, be kept in a respectable grade of dull mediocrity, but can never be raised to its proper position—at the summit of the arts, till it be undertaken with a nobler intention than to make it pay.

Architecture also may err and has erred inasmuch as association and prejudice have fettered it with the arbitrary laws of antiquarianism in its search after abstract beauty and sublimity. Such a catalogue of examples have been deduced from the works of the ancient masters, and fitted together, as a puzzle by a child, into a system that these masters themselves never dreamt of, to which it is attempted to bind us by an exact compliance, compelling a mere reproduction of their facts, and debarring us from venturing to the same source whence they drew, lest we might do aught for which we had not their authority, and thus would each work executed be the diminishing the range of invention, the rivetting another link to the chain, confining our liberty, instead of the adding of man's thought to thought,—the widening the sphere of our knowledge,—which knowledge is power, and given to us for further use, that having learnt how the great masters have applied those types chosen from the exhaustless stores of nature, we may likewise apply others for ourselves.

It now, however, appears to be generally acknowledged that we have a record of our own to leave, a transcript of the feelings of the age to embody in our works, and that, therefore, we *should strive* after more than a mere reproduction of those of past ages, and that we might effect more than has yet been done.

The question, then, by what means are we again to reach the true path of progress? is to us of the utmost practical importance, and is one that is occupying considerable attention. Nor has this question been raised without any attempts having been made to answer it; several suggestions have been offered for its solution.

It will be well, therefore, to take a brief review of the direction this movement has already taken, to endeavour to ascertain the position in which we are at present, to test the application of these suggestions to that position.

And, first, several voices have been raised in condemnation of our practice of following by turns Egyptian, Greek, Roman, or Goth, as fashion might sway, and warning us of the maze of error in which we were wandering without hope of freedom, bidding us to halt in our mad career, denouncing the false system of copyism, and, though, indeed, they pointed not out the right path, strove to lead us from the wrong one, — impugned the all-enslaving authority of antiquity, and put aside the distorting medium of association,—bid us to think for ourselves, and not to pilfer the thoughts of our fathers,—which first rent the veil of black darkness that overshadowed us, and rang the death-knell to the practice of a century. This, however, alone, would help us but little on our way, unsupported; it could only unsettle the mind for a time, till, disheartened by the knowledge of failure, we should relapse into a more hopeless state than before.

But further and next were we directed to the study of nature, and though to some this advice appeared, and even now appears, vague and unprecise, and from its want of precision was even rejected by others, it contains all the germs of truth; for as the children of nature, it reminded us of our mission as her disciples and expounders, for man has no other source of inspiration open to him, nor any other school wherein he can learn equal power or grace and refinement. This, then, was a beacon light held up, which flashed astonishment to those who trusted to the glimmerings of their own unaided inventions, that dreamt not of a brighter source than the reflected rays of a past and borrowed inspiration, and though in the panic of the moment this transferring of our allegiance from the tyranny of antiquarianism to the principles of nature, was stigmatized as presumption: truly there was more of presumption in the setting up of man and man's rules in her stead.

Nor is it to architecture alone that this salutary movement has been confined. There is in the other arts at the present day, an evident attempt after a *careful* and simple study of nature, the ground-work of all excellence.

Yet though this be a great step in advance, it is not sufficient for our purpose; for, as it has been observed, while *painting* and *sculp-*

ture are imitative arts, for which a faithful rendering of the works of nature suffice: *architecture* deals more with her principles than her individual forms, and needs, therefore, to be shown how to deduce these principles, and further to learn how to apply them to her conventional purposes.

Thus in designing ornament, the province of the architect is to seize such salient points as may suggest the characteristic form of the natural type, without carrying the imitation so far as to destroy the idea of the material on which it is represented, or destroying its breadth of light and shade, necessary as the portion of a great whole, rather than an object perfect in itself.

Towards the right comprehension of these principles, the next step in advance, much that is practically useful has been contributed by Mr. Ruskin, on their application to art in general, in his treatise on the imaginative and theoretic faculties, as well as on their application to architecure in the "Seven Lamps," the brilliancy of which, however, vanishes sadly into gloom when he approaches the point under consideration, in the "Lamp of Obedience," where he forbids us all hope of progress till we can again merge the profession into a band of Freemasons, and "teach our architecture at our schools, from Cornwall to Northumberland, as we would teach English spelling or English grammar,"—where he proclaims that "until a universal system of form and workmanship be everywhere adopted and enforced, our architecture will languish in the dust,"—"that the only chance for architecture rests on the bare possibility of obtaining the consent of architects and the public, to choose a style and use it universally;" which opinion is also supported by Mr. Fergusson, who tells us that a gradual national improvement of some style universally chosen and practised, will alone effect progress in *art*, by the same means as facts are accumulated in physical science, from which he traces the arts in regular gradation, and would thence conclude that the same causes influence the whole series, and would therefore discourage the idea of individual improvement, and prohibit any from practising otherwise than on the general design, which alone they might add to, improve, or correct when in error.

These views are plausible in theory, but, as regards practice, utterly impossible. The scheme is opposed to the spirit of the time; for the days of feudalism and monastic compulsion are past. Architects are no longer an order of priests. The very numbers in the profession preclude a hope that they could, even if they would, submit to such a thraldom. Nor would the public remain satisfied with the monotony that must ensue. Mr. Ruskin himself fears its impossibility, but asserts that with that he has nothing to do. Yet indeed we have something to do with its possibility, for the present is one phase in the general development of society—one page of the history of its progress, to which the world has not arrived by chance. To deny to it the possibility of progress, is to assert that Providence is at fault, which is an anomaly: we may be sure that we can never be placed in a position where our duty should be impossible.

Nor, as has been before explained, need the parallel between physical science and architecture necessarily hold good. Under certain peculiar circumstances it has done so at some former period, which has given Mr. Fergusson the pretext for his argument. But in each case these circumstances were different from those of modern times, and impossible to be revived. As in the states of Greece, whose principal architectural structures were temples, each like the preceding, with such refinements only as experience might suggest, with no other variation for centuries; or in the mediæval ages, under an ecclesiastical monopoly, to which all learning and literature, as well as architecture, was confined, by whose members alone any sacred structure could be built. Then there is at least an equal precedent, not taken into this account, on the opposite side, under circumstances far more similar to our own; for neither Brunelleschi, Alberti, San Gallo, Palladio, Vignola, nor the other illustrious architects of Italy, were members of a band of Freemasons, but studied as we do now, and worked as we might do now, individually producing works of undeniably high merit, stamped with their own individuality, and yet conforming to the manners and feelings of the age; and, further, have we bright examples among our own countrymen, Wren, Vanbrugh, Inigo Jones, Sir Wm. Chambers, &c., to whom, as members of no clique, nor yet having learnt their architecture as their spelling, hope of progress might as reasonably have been denied as to us.

But other methods have been suggested besides these for the renovation of our art. We have been told that the mediæval architects worked out their glorious styles from the precepts of Vitruvius, and thought their result the same which he had intended, and we have been advised to follow the same course. It must, however, be acknowledged, that if they did think so, they made a great mistake, though a fortunate one perhaps. It is equally certain that we should make as great a mistake. But the chances of its being so fortunate are ten thousand to one.

Others imagine they have discovered the traces of a system of geometry, by which they produced their works. Now it is probable they did so, and it is certain that geometrical science is most useful to architecture; yet I fear, that if we wait till we can have fitted together its scanty relics, it will be for us at least so late, that when we have found the route we intend to pursue, we shall then be tempted to say with Sir Joshua Reynolds—"were I now to begin again, I would pursue such a course."

All these suggestions seem to take it for granted, that the formation of a universal style on the model of those of past ages, is the grand consideration. It may be, that one or other of these methods is the only one by which such could be produced. But then it is not necessary that such a style should be established in order that architecture may progress. We look not that our painters should give precisely the same features, the same attitudes to their figures, the same composition or tone of colour to their pictures. The day has passed when the works of a nation should be reckoned in the aggregate, and their growth described as regularly as that of a vegetable.

We want neither a new nor a universal style: we should know nothing about styles; the very name is a bane and a hindrance to architects, however useful to the antiquary. Let us leave it to posterity to classify our productions, and be sure that if we work simply, neither copying nor striving for singularity, we cannot so completely emancipate ourselves from the feelings of our own age and country but that they will give an impress to our work, though we may not discern it for ourselves. We shall at least work that which shall have the appearance of life; and rudely, it may be, yet surely, pierce to the sympathies of men. Let us, then, shun plagiarism as a stain on the reputation of the architect, as it would be in literature; and then all beauty is common. Columnar architecture, and delicacy of moulding, and precision of symmetry are not the inalienable property of the Greek, though his several and peculiar orders are. Lofty proportion, vigorous light and shade, fairy tracery, fretted vaulting, are not a Gothic patent, though each of their cathedrals, with all its crisp foliage, and quaint imagery or curious penetrations, and various details, left to us throughout the length and breadth of the land as a record of the labour and zeal and love of their builders, is a *sign manual*, which it is *forgery* for us to repeat. The well whence they drew is open to us, and we may do more and better than they, since they have shown us how, and we have not all that lesson to learn for ourselves.

The remedies, therefore, that have been proposed are too violent for our case. Yet though we cannot compel such a unity of practice throughout the profession, we may and must expect, if we are to look for progress, a far greater degree of consistency in that of its individual members than there is at present, for one thought fully carried out is sufficient for a man's life, nay, is a legacy he may be proud to bequeath. If, then, in pandering to the appetite for novelty, no two designs of an architect are to resemble each other, there is no help for him but to continue copying the works of others, without resting to perfect one idea of his own: the lamp of obedience is a noble one, and necessary to rescue us from restless agitation for novelty, which is as injurious as the opposite extreme. All progress must be founded on what has been done before. Whatever precedent then a man selects, let him keep to that, improving thereon to his utmost, nor be driven from his post by the withering storms of criticism, which are too certain to arise whenever anything that has not previous authority is attempted.

It is then upon our own individual improvement and consistency we must depend for progress. There is little practical use in seeking for new theories for the development of architecture, for the present system is sufficient for our purpose; it is reform, not revolution, we require,—a higher aim and a recognition of the dignity of our art,—a closer study of the forms of nature, by drawing the human figure and natural objects, as an important branch of our education (one, however, seldom considered), by which the taste would become refined, and such a feeling for beauty given as would not desert us throughout the sterner studies of the science,—a due comprehension of the principles of architecture derived from nature, of which proportion and symmetry form the foundation,—and, further, in practice and in criticism, the exercise of common sense; for much evil has arisen from treating architecture as if amenable to some other peculiar laws. How often do we hear persons refuse to judge of a building by the same tests they would apply to other things, on the grounds that if it do not please them, it may yet be *in the style*, as if *style* were an excuse for ugliness, a species of juggling known only to the initiated! As in literature, it is not well to mince and pick and choose our words, and cavil about the rounding of a sentence, lest to such minor points we sacrifice the point and pith of the argument, and as we should rather seek to write with terseness and energy what we have to say, and look to the matter and not to the manner,—so in architecture, let us not worry ourselves to be original, nor strive to be peculiar. "Genius," says Emerson, "leaves to novices the gay, the fantastic, and ostentatious, and itself pierces directly to the simple and true." "Nothing astonishes man so much as common sense and plain dealing."—JOHN P. SADDON.

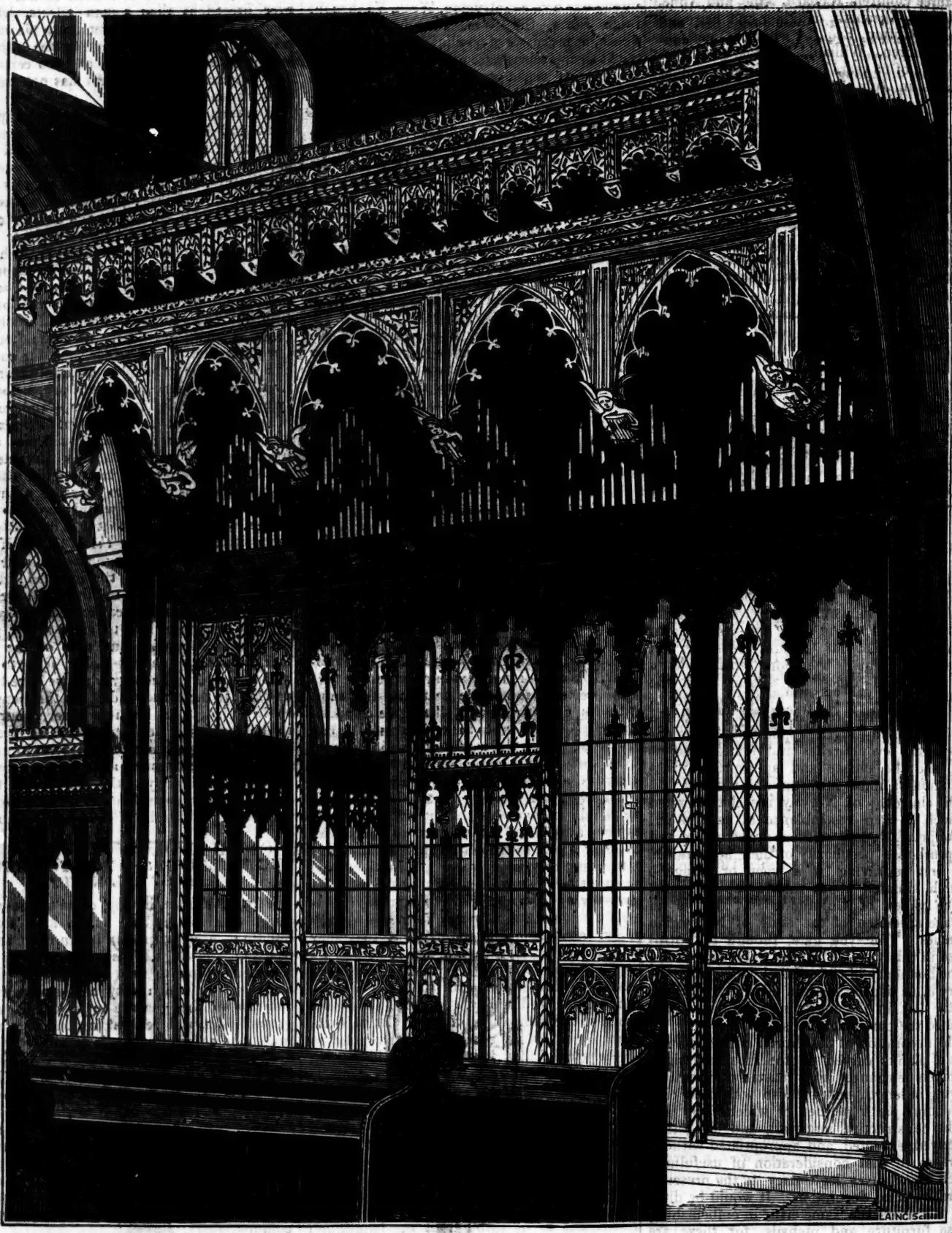
THE BUILDING, &c., FOR THE EXHIBITION OF ALL NATIONS.

THE committee having come to know that many contributors of suggestions for the building are preparing complete sets of working drawings, wish us to call particular attention to that part of their former statement in which they ask for *suggestions only* as to the general management of the ground-plan, and request contributors not at present to enter into details of construction or architectural decorations.

After the general arrangement of the building has been determined by the aid of the plans and suggestions now called for, it is the intention of the commissioners to invite, by *a second public notice*, designs, accompanied by tenders, from architects, builders, and manufacturers, for the construction of the buildings, of the form and according to the general arrangement which shall have been thus fixed upon by the commissioners.

At a meeting held at Huddersfield last week, to give the operative classes an opportunity of expressing their sentiments on the projected exhibition, a mechanic, who stated that he had invented a valuable machine, but could not protect it by patent for lack of the necessary funds, started the question, whether the exhibition of an unpatented invention at the Industrial Exhibition of 1851 would be deemed a publication. He said that many who were in his position would be glad to exhibit, if they were protected from the consequences ordinarily following a publication; and he suggested that some special provision should be made in this case: his views met with the general approbation of the persons assembled.——A public meeting will be held in Kensington on the 20th inst. A strong committee has been organized there, and will doubtless render good service to the cause.——In London city, they expect to raise about 30,000*l*. The corporation gave 500*l*. A ladies' committee has been appointed there to promote the object.

ROOD SCREEN, SEFTON CHURCH, LANCASHIRE.



ROOD SCREEN, SEFTON CHURCH.

The village of Sefton, in Lancashire, is about eight miles from Liverpool, a little to the left of the high road to Ormskirk: it is situated on an extensive range of fine flat meadows, that reach almost to the sea, and which are annually irrigated by the Alt, a small trout stream. It is a parish and manor, and formerly belonged to the Molineuxes, who possessed it from their Norman ancestor, William de Molines. It was granted to him by Roger de Poictiers, to whom the Conqueror had given all the lands between the Ribble and the Mersey. Previous to that event this manor was held by five Thanes.

The church, which is dedicated to St. Helen, is said to have been erected in the time of Henry VIII., by Anthony Molineux, rector of the place; but a part of it has evidently been built at an earlier period, from the various styles of the windows, and the unconnected manner in which the walls are jointed, particularly on the north side: there are also two effigies of knights templars, branches of this family, one of which in the present state of the church does not appear to have a proper situation; and on the stalls, screens, &c., there is a repetition of the initials I·M, which must allude to some other member of the family.

The chancel is divided by a screen from the body of the church, and contains stalls arranged alphabetically; the style of the letters is unique, being in unison with the general character of the ornaments, and is perhaps the most complete specimen of the kind extant. They are represented in the twenty-fourth plate of Bridgen's work on Sefton Church. In the chancel and chancel aisles, for a series of ages, have been deposited the remains of the Molineux family; and several of the monumental memorials of the illustrious house are still preserved. Around an altar tomb is an inscription in memory of Sir Richard Molineu and Joan his wife, who died in 1439; there are effigies in brass of Sir William Molineux and his two wives and thirteen children; also of Sir William, son of the above, his two wives and six children. Four of the plates are lost. The one bearing the inscription is preserved, of which the following is a translation:—"Sir William Molineux, Knight, lord of the manor of Sefton, who was sent three times against the Scots by Henry VIII. of England: in war he fought most courageously, and at Flodden, with his own hands, took two of the Scottish banners in spite of all their resistance: in peace he was the friend of all mankind, assisting with his counsel those who wanted advice, and with his purse those who wanted money:

he had two wives,—the first, Jane, only daughter and heiress of Sir Richard Rugge, Knight, of the county of Salop, by whom he had three children, Richard, Jane, and Anne; the second, Elizabeth, daughter and heiress of Cuthbert Clifton, Esq., by whom he had also three children, William, Thomas, and Ann: after a life of 65 years he was laid here with his ancestors in July, 1548, in the hope of the Resurrection."

In the painted glass of the windows are several inscriptions,—one to A. Molineux, dated 1542,—another to Margarete Bulckeley, daughter of Sir Richard Molineux, dated 1543. In this church also are deposited the remains of the family of the Blundells of Ince-Blundell, a name well known to the lovers of the fine arts.

Our plate of the chancel screen represents it in its perfect state, before the alterations in the year 1818 were made. R.

STATE OF ART IN NORWAY.

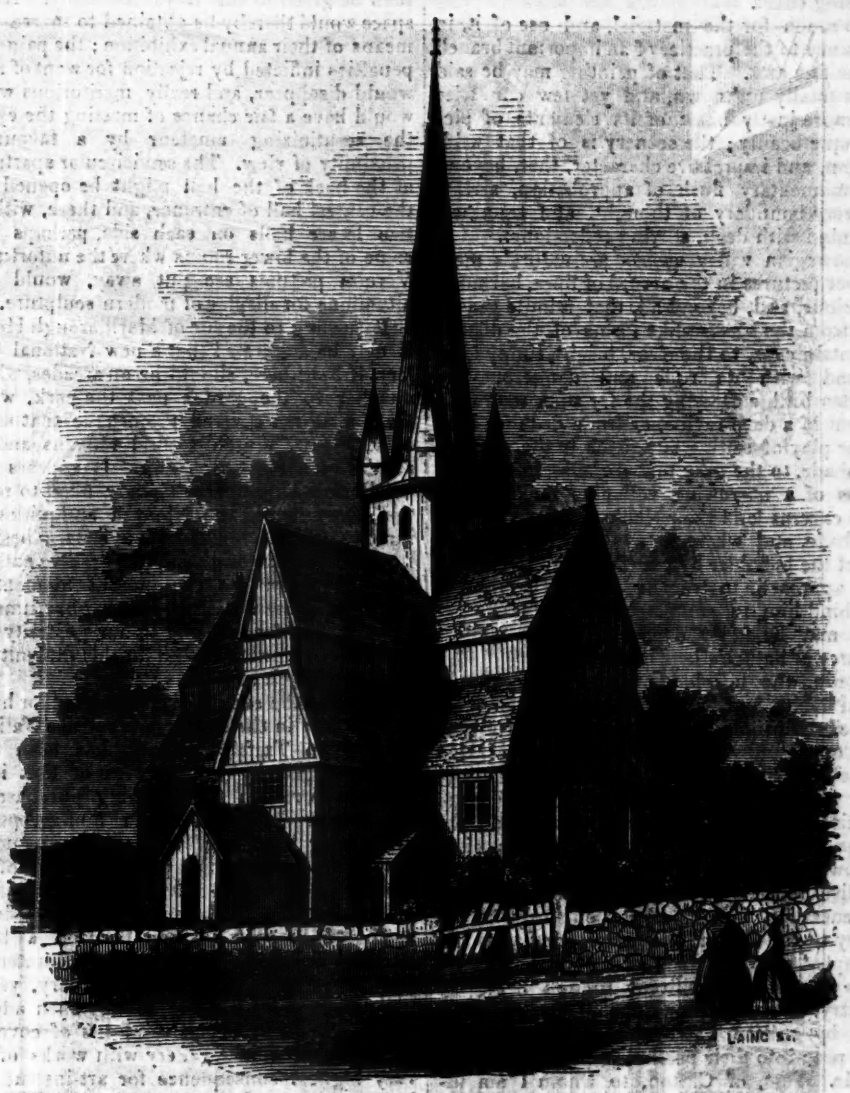
CHURCHES AND SPOONS.

The accompanying engravings exhibit, by a strange contrast, the peculiar state of art in Norway. The inhabitants of almost all civilized countries have succeeded, by untiring mental energies and ample contribution of funds, in rendering their religious edifices objects of architectural beauty, but such, it seems, is not the case with the Norwegians, who, although rigid observers of the laws of their religion, and most generally attached to their church with more than ordinary sentiments of love and veneration, fail in the demonstration of that universal evidence of religious zeal that demands the exercise of an art so closely allied, by its study and associations, to the worship of our Creator, Preserver, and Benefactor. This is the more remarkable, in the absence of almost all dissent from the established church, as well as the existence of an intuitive love of art, although uttered sparingly, in ill-judged application, to the entrances of a few churches and domestic buildings, and the chaste and appropriate ornamentation of house furniture and utensils.

The churches of Norway are characterized as much by their resemblance of each other, as the primitiveness of their construction and the penthouse peculiarity of their appearance. The first engraving is a view of Ringebo Church, situated about midway up the picturesque valley of Gulbrandsdäll, and is an average specimen of the style of Norwegian churches. The lych gate, though not introduced in this view, is almost everywhere seen in the boundary of the churchyards, and the belfry is, as usually made, a detached building, on the left in the engraving: on the right is situated the parsonage-house.

The decoration of the church entrances consists of planks carved on the face, in designs of much elegance and masterly execution, varying in length and breadth with their corresponding parts (neither of which form part of the constructive material), and altogether conceived, executed, and appropriated without reference to that consideration of usefulness which alone gives legitimacy to the presence of architectural decoration. It would be difficult to commit the same error in embellishing house furniture and utensils, for these are articles of frequent manual use, and all that would be incongruous in their form would be abandoned by admonitions from the most primitive mind; and hence we find in the examples, figs. 2 and 3, specimens of art, in which the combination of usefulness with embellishment is productive of harmony, and illustrative of the principles of true art. The houses of the rich, and equally so those of the poor, are stored with these beautiful examples of wood carving, less excellent in design and execution than the like productions of no other country. It must therefore be remarked, that whilst Norwegian art suffers materially from the want of well organized institutions for its study and cultivation, nature has formed the taste in all classes of society from the monarch to the peasant, in the sources of wealth and necessity, in the seclusion of mountain habitations, as well as those of populous towns and villages, for that equitable balance of subject, happy contrast of surface, and harmonious combination of lines, the union of which mark the excellence of artistic decoration.

RINGEBO KIRKE, NORWAY.



NORWEGIAN SPOON HANDLES.

Fig. 2.

Fig. 3.

The specimens of design and execution illustrated (of alderwood), will amply corroborate that assertion, they being the ideal produce and handicraft of a mountain peasant, and average specimens of their skill.

There are no public buildings or institutions in Norway, exclusive of the churches: and these, as well as the domestic buildings, are erected of wood, with but a few exceptions,—such as the king's new palace at Christiana, and the Cathedral Church of Stikklestad, north of Drontheim, which, with a few other unimportant exceptions, are of stone. This results first from the peculiar nature of the stone, which is chiefly silicious, of an irregular fracture, and therefore expensive to work; secondly, the scarcity of lime; and, thirdly, the abundance and cheapness of timber.

The mountains are composed chiefly of micaceous schist, which the heavy rains in winter are constantly washing down in broken masses.

Amongst the peculiarities of custom may be mentioned the frequency of carving, on frieze boards or facia boards (running horizontally round their dwelling houses) the will and tes-

tament of the owner, and being written in characters of quaint design, it has a somewhat pleasing effect.

So much for the material, and use of it, in reference to the practice of an important branch of the fine arts. That of painting may be said to be totally unknown, and yet few countries can more justly boast of its elements of picturesque beauty; the scenery is of that wild, solemn, and impressive character, that, beyond the momentary flush of approbation, arrests the very boundary of thought, and trammels the mind with deep, stirring reflections.

Norwegian valley scenes are nature's most perfect pictures in the accord of lines, harmony of colour, and, beyond all, that minute gradation from the spectre-like forms of the distant mountain caps, to the clear, bright, sunny foreground with its rude and dangerous-like wooden bridge crossing the far sunk mountain torrent in a deep ravine, or from distance held in the play of setting sun, back to the mellowing shade, to the gray mid-distance, to the dark recess of a narrowing valley of rocks, where deep caverns lend their shadows to the universal shade, and where artists love to lead the eye of the beholder by cunning and imperceptible approach, to transfix him with emotion and bind him in contemplation. These subjects may be fairly denominated the noblest features of nature's landscape.

Again, the hospitable character, costume, social habits, and, above all, peaceable condition of the people, affords numerous subjects and opportunity for the enjoyment of this branch of the fine arts, but, strange to say, that whilst music, singing, and dancing are practised with skill, painting and drawing are comparatively unknown; and yet the praises bestowed by them on the artistic works of English tourists in Norway, denotes the bud of veneration for this neglected study. I am happy to say that of late years good taste has prompted a few English artists to direct their steps to this magnificent though neglected country, a better knowledge of its character than by written description being obtained by a peep into their portfolios, particularly that of Mr. West, of Clifton, to whom I am indebted for the view of Ringebo Church. Organized institutions for the study of art are alone wanting to class the Norwegians with others of the present age who are striving so successfully for its revival and improvement, and although in reference to this subject they hold a somewhat anomalous position, yet it must be remembered that they are capable already of works worthy our imitation, their minds are framed for the impressions of art, their country abounds with the requisite material, and the state of their society is genial to its birth and existence. R. C. S.

A SITE FOR THE NATIONAL GALLERY.

MARLBOROUGH HOUSE—HAMPTON COURT.

The lamented demise of the Queen Dowager has given occasion for a multitude of persons to view the interior of her late residence in London, called Marlborough House. This occasion, however mournful, becomes eminently favourable to entertain a project which would relieve very great and acknowledged difficulties in the two most important institutions dedicated to the furtherance of the fine arts.

The numerous visitors to Marlborough House must have become thoroughly acquainted with the considerable area occupied by the entrance, court-yard, stabling, offices, mansion, and garden. They have also seen that the apartments, and the distribution of them, have neither the grandeur nor convenience fitted even for a ducal residence, much less for any distinguished branch of royalty. The house has been so long and frequently unoccupied, or tenanted by others than by its noble possessor, that possibly it might be ceded upon conditions which, for many reasons, would be advantageous to the proprietor, and thus become a public property. A most magnificent area and situation would then be obtained, upon which a national gallery might be erected, worthy of the high position of Britain among the civilised nations of the earth, and worthy of a living school of art, which bids fair to take equal rank in excellence with any of the European schools, either of the past or present age.

The wing of the building now occupied by the national pictures in Trafalgar-square could then be given to the Royal Academy. Ample space would thereby be obtained to increase the means of their annual exhibition; the pains and penalties inflicted by rejection for want of room would disappear, and really meritorious works would have a fair chance of meeting the eye of the scrutinizing amateur by a favourable proximity of view. The semicircular apartment at the back of the hall might be opened into the central hall of entrance, and these, with the two lesser halls on each side, perhaps with some of the lower rooms where the unfortunate Vernon pictures are put away, would give situations for display of modern sculpture.

Returning to the site of Marlborough House, it may be suggested that a new National Gallery, if built here, should be on arcades, which, opening to the garden next the park, would make a superb covered promenade that might be stored with architectural remains and examples of ancient sculpture. It appears that the British Museum is already filled to repletion, inasmuch as the Nineveh antiquities are inconveniently crowded in a cellar; besides, the works of our own sculptors deserve national recognition, and to the present moment no project has been elicited, either governmental or otherwise, for securing to our posterity any proofs of our native skill in this difficult and sublime branch of art.

Hitherto the restricted convenience for hanging pictures in the apartments called a National Gallery in Trafalgar-square, has been constantly urged by the trustees of that institution as a reason for declining purchases in addition, and even for the non-acceptance of gifts or legacies of works of consequence. Although, perhaps, the principle is not of the most refined quality of honour to accept gifts of valuable property, being somewhat akin to sueing *in formâ pauperis*, or for a high-minded people to become legacy hunters of pictures to fill a more enlarged gallery, yet we possess, without trusting to any such adventitious additions, extensive means of covering the walls of a new gallery with works of the very highest consequence for art-instruction, both to its professors and admirers. The cartoons of Raffaelle might be covered with plate glass, and brought to London. At Hampton Court they are absolutely useless, being hung too high for any searching examination; and the tranquillity absolutely necessary to study their intense beauties interfered with by a vulgar crowd, more excited and anxious to view a contested swimming match in the river to catch a live pig, which was weekly instituted last year by the officers of the dragoon regiment quartered there. These gentlemen gave a shrewd estimate how valueless the wondrous cartoons of the divine master were to the majority of the Hampton Court visitors.

Hampton Court contains, also, the admirable friezes by A. Mantegna: these, although painted over by an inferior hand in many parts, would probably disclose their virgin purity if the retouches were removed. There are also some works by Julio Romano, from the palace of Mantua, seldom noticed, but of great value to the student in high art: a magnificent Tintoretto has been lent to the Royal Academy, and now excites the admiration of every one who views it there. Many others might be named, but the ceiling in Whitehall Chapel, by Rubens, cannot be omitted. A dozen years since this series of pictures was taken down, found to be in the most perfect state, and in the master's finest manner. Of what use are these splendid works to the study of grand art, depending on the charms of colour, in their present situation? If our national gallery were possessed of this series by Rubens, and the cartoons of Raffaelle, it would at once raise the national collection to a level with the great galleries of Europe, and fulfil its proper destination of instruction both to artists and the public. The vacant spaces in the ceiling of Whitehall Chapel would give a brilliant opportunity for perpetuating the fame of any one of our great painters, by giving him a commission to fill it. Had we done this by Etty, what a monument of the English school would have adorned the capital!

While on the locality of Marlborough House, it may not be out of place to suggest a very trifling change which might be advantageously made here in the entrance to St. James's Park; that is, to cut off about 60 feet of the garden of St. James's Palace, which is elongated beyond the building, and to carry the roadway straight from Pall Mall into the park. St. James's Park cannot be said to have any very convenient or ornamental entrance from the metropolis, the low contracted arches of the Horse Guards being both mean and obstructive; the way through the stable-yard and Cleveland-row is also the reverse of spacious or beautiful; while cutting away this small slice of the garden would afford to the Sovereign and the Court a broad, airy, and unobstructed communication between the most elegant street of the capital (Pall Mall) and the palatial abode of royalty.

At present this tortuous way, occasioned by this small spot of inclosed garden, is scarcely frequented; grass grows between its uneven pavement; and a large dust-bin, with its cavernous mouth fully expanded, betrays accumulated filth, cinders, cabbage stalks, and broken garden pots! Such is the most open and spacious entrance to St. James's Park!

EXPANSION OF THE IPSWICH MECHANICS' INSTITUTION.

The erection of a spacious hall, 63 feet long by 40 in width and 26 in average height, as an addition to the previous premises of this thriving institution, was too important an event to pass without special commemoration; and accordingly the hall-heating was celebrated on Tuesday evening in last week, by a numerous and highly-respectable assemblage of the patrons, members, and friends of the institution, who spent the evening in harmonious association, with music and eloquence, interspersed with temperate physical refreshments. Mr. J. Cobbold, M.P., occupied the chair, and was accompanied by the mayor, the recorder, Mr. T. S. Gowing, Messrs. A. and R. Ransome, Rev. J. Lord, and other gentlemen. The hall was graced by the presence of many ladies, to whose paramount influence over the rising generation, and importance as their earliest educators, the recorder, Mr. David Power, took occasion to make pointed and impressive allusion, in a speech received with repeated expressions of applause.

He had heard, he said, but the idea always jarred upon his mind, that they came to a meeting like that merely to grace the scene. He did not derogate from their grace; far from it. But he thought they ought to come, and he believed they did come, many of them, from a far higher and far holier motive. There was no class upon whom intellectual culture was more incumbent, or was a more sacred duty than upon the women of England. If they felt the duty that was imposed upon them, as they must feel it, they would own that mechanics' institutions,—in the lectures that were delivered within its walls, in the books which adorned its shelves,—that these should be participated in, as he was glad to observe was the case here, by the women as well as by the men. If there were any feature in the present times more gratifying than another, it was to see the great truth at last beginning to be acknowledged, that the sacredness of intellectual culture was felt as much by the one as it was by the other. He believed we should not live to see it, but those who came after us might, that when women received the education to which they were entitled, they would make of the men a different race from what they now were, to carry on the work of reformation throughout the world. If what were really in his own mind most solemn thoughts had found a resting place in the heart of but one individual present, if they fructified and brought forth, unknown to him, and unknown perhaps to the individual himself, good fruit in future, then he should be heartily content.

The meeting was afterwards addressed by Mr. Gowing, to whose energetic and continued exertions the result which the meeting had met to celebrate is mainly due. Mr. Ransome, the secretary, gave an official speech, and the meeting was also addressed by the Rev. Mr. Lord and other gentlemen. In responding to a vote of thanks to the building committee, Mr. Gowing complimented the architect, Mr. Woolnough, Mr. Whight the contractor, and

the workmen, for the way in which the works had been carried out.

The hall floor, for convenience of sight and hearing, slopes upwards from the platform, which is on a curve at about 2 feet from the floor. The walls are faced with Roman cement, stone coloured, and relieved by pilasters. The ceiling is divided by beams into compartments, the two central filled with ground glass sky-lights, and surrounded with perforated zinc ventilators. From each angle of these also depends a bronze chandelier. The wall on the platform side is set in with wood painted of a deep blue for chalk illustrations to lectures. An apparatus for warming the hall with hot water has been fitted up. The chief entrance is from Tower-lane; a more characteristic and dignified entrance, however, is wanted, to be in keeping with the extended scale and importance of the institution as it now exists.

DISTRICT SURVEYORS' FEES.

It is perfectly well known to the profession, that there is but one district-surveyor who has the brass to send in *such* an account as that quoted in your last week's paper; he is the same who was exposed recently for having charged 1*l.* 15s. for surveying the fixing of an Arnott's ventilator, and his name is too familar to all our class. But THE BUILDER is now taken in by and perused at clubs, and by mercantile men, and private families, many of them our personal friends or our clients, who are fortunate enough not to have heard the name of the person in question.

Your kindness to him, in withholding his name from the public eye, I for one cannot "appreciate," for your generosity is bestowed at my expense and that of my brother surveyors, who are not a little indignant at the dirt which this man is throwing upon the whole body. With due submission, too, I beg to differ from you on the propriety of your silence, in another respect besides its evident injustice. I look upon you as a public moralist in all matters relating to building; you freely indulge in the pleasure of praise, when praise is merited; and I humbly think that it is your *duty* to censure when the reverse is the case, and to censure most severely, too, when such very gross attempts at exaction are persevered in, as the one now made public. It may be said that the award is sufficiently condemnatory. It would be so, no doubt, if this were the first offence, but to an old offender the lash ought to be laid on less scrupulously, and in this case it would require a relay of builders to handle it well.

I regret exceedingly (but for his sake alone) that I feel myself compelled to make these remarks; and if you had only named the man, I should not have said one word; but I affirm that, by your silence on that head, you have indirectly implicated my credit and that of many others, in the subject-matter of your statement; and whilst I write to deny that I am the surveyor alluded to, I trust I shall be excused for expressing myself with some of the indignation which I feel.

HENRY BAKER.

Upper Gower-street, March 11, 1850.

WATER FOR THE CITY.*

MR. HAYWOOD has rapidly followed up the report recently noticed in THE BUILDER by the present, constituting, in fact, a little book on water-supply. He gives it as his opinion—

"Firstly, that the water companies should be bound to supply 30 gallons per head per diem, should the anticipated prospective fair increase of consumption take place.

Secondly, that *whether a constant supply is or is not given*, it is desirable that a *supply at a pressure sufficient* to deliver water at the tops of all the houses should be given uniformly throughout the city of London. That if a *constant supply* is given upon the *intermittent system*, and adequate cisternage is provided so that water may be drawn at all times between the intervals of supply—the supply *is practically constant* to the consumers; but that many instances exist where, if the constant supply fulfilled its signification, and cisterns could be dispensed with, it would be a great benefit. That inasmuch as it appears questionable whether it is expedient to discontinue the use of cisterns, even if the constant supply be given—and also, that it may be found necessary to incur a large expense to effect and maintain a constant supply, without a commensurate benefit, application should be made for the trial of the system of *constant supply at high pressure* upon a particular district within the city of London for a given period, in order to determine accurately what are the effects of its introduction as regards waste, and what benefits may practically be derived from it."

Though not specially referred to him, the author also treats pretty fully on the subject of quality and price.*

* Report to the Committee upon Health of the London City Sewers Commission, on the Supply of Water to the City. By W. Haywood, Surveyor to the Commission.

Miscellanea.

BUILDING SOCIETY DISPUTES.—In a chancery suit, at the instance of Mr. Seagrave, for the redemption of a mortgage of leasehold property by the solicitor and trustees of the Camberwell Building and Investment Society, whose rules were drawn up in conformity with the provisions of 6 and 7 William IV., cap. 32, Mr. Parker, for the plaintiff, argued that his case was distinguishable from "Mosley *v.* Baker," decided by Vice-Chancellor Wigram (17 *Law Journal*, N.S., 257), inasmuch as he had not discounted or anticipated his shares, but had merely received money on the security of his property, and that if he repaid the amount he had received, he continued a member of the society. This was a loan upon security; "Mosley *v.* Baker" was a case of purchase of shares in the strictest sense of the term. For the defendants it was contended that the case must be governed by "Mosley *v.* Baker." Vice-Chancellor Sir J. L. Knight Bruce, without calling upon Mr. Parker for a reply, gave judgment, and observed that he had given the case very careful consideration. He thought the notice given by plaintiff of his wish to satisfy the mortgage, one month before the commencement of the suit, was perfectly valid and binding, the deed not precluding such notice. Plaintiff was entitled to have restored to him the property comprised in the deed upon paying the balance of the 544*l.* at the end of a month from the notice, with interest at 4*l.* per cent. from that time, he having credit given him for the monthly payments of 8s. 6d., so far as they had been made by him to that period. The plaintiff ought to be debited with the monthly payment of 3s. 6d. for redemption money, so far as not paid by him within the same period, but not with any monthly payment in respect of any period subsequent to the end of the month in which notice was given. The case of "Mosley *v.* Baker," he was of opinion, did not govern the present case. Upon the subject of costs he thought that the rules and the deed were of such a description that there ought to be no costs allowed on either side. During the debate in this case, the judge, as well as the plaintiff's counsel, gave expression at some length to sentiments in regard to building societies in general, as at present constituted, in entire accordance with those repeatedly pronounced in THE BUILDER.

WIDE ESTIMATING.—Tenders for reparations and alterations to the machinery and going gear in Sunbury windmill: Mr. Edward Ryde, engineer:—

Stewart, Clement's-lane	£170 0
Chamberlin, Hampton Wick ..	162 0
Smith & Co., Princes-street, Leicester-square	90 0
Ashby, Croydon	69 0
Bishop and Spencer, Guildford	59 8
Moore, Sevenoaks (accepted)..	54 0
Budgin (too late)	51 0

* A "Metropolitan Parochial Water Supply Association" has been instituted for the practical application of the following propositions:—1. That water is not a proper object for mercantile profit. 2. That its unlimited and pure supply ought to be furnished at the bare cost of its distribution. 3. That it is the interest and the duty of the community to enforce the introduction of an abundant supply of pure water into every house in the metropolis, without exception or distinction of class, on the principle of constant service and high pressure. 4. That the necessary supply should be managed by a parochial representation, regulated by a competent commission chosen by the consumers, and paid for by a parish rate on the adjustment of an equal assessment. 5. That the supply of water to great cities is a duty which should be undertaken by the public, and that the right of the poor to a competent supply of this primary element is as clear as the duty of the community to place the indigent beyond the want of bread, although 70,000 houses within the metropolitan districts are left without any conveyed supply of water, and the proportion furnished to each consumer, already totally inadequate, is yearly diminished by the wants of 45,000 additional inhabitants.

PROJECTED WORKS.—Advertisements have been issued for tenders, by 25th inst., for station-houses and gate-lodges between Nottingham and Grantham, for the Ambergate and Boston Junction Railway; by 26th, for making and constructing drains and sewers at Eton; by 22nd, for erecting about forty carcasses of houses at Dalston; by 23rd, for the erection of twenty carcasses of houses at Kingsland-road; by 23rd, for carpenters' work on the metropolis roads; by 22nd, for repairs of pavements, &c., at Poplar; by 21st, for paving in St. George's-in-the-East; by 21st, for paving and repairing streets and ways in St. James's, Clerkenwell; by 1st April, for the construction and erection of iron roofing over 6,800 square yards of new London Terminus of Brighton and South Coast Railway; by 28th inst., for 440 wheel tyres for carriages and waggons, also 400 bearing springs and 200 buffer springs for the Eastern Counties Railway; and by 19th, for repairing turnpike roads at Wearmouth.

METROPOLITAN SEWERS COMMISSION: DRAINAGE OF LONDON.—At a general committee meeting on Friday last, the report from Sir H. De la Beche, Captain Dawson, Sir John Burgoyne, and Mr. R. Stephenson, on the drainage plans, was received. The private deliberations of the committee occupied nearly three hours, but the report has not yet been submitted for consideration in open court. ——Considerable dissatisfaction has been expressed by the rate-payers of St. James's, Westminster, on the subject of the new commission's proceedings. At a recent vestry, the following resolution was proposed:—"That the vestry learn with surprise and regret that the new Commission of Sewers for the Westminster district, in which this parish is comprised, have sanctioned a large outlay of the rates for the construction of a new and additional sewer, which is to have its outfall into the Thames, thereby, in the opinion of this Board, contravening the great object of the appointment of the present commission, which was to devise a plan for diverting the sewage from the river.—That the vestry have learnt with equal regret that the Court of Sewers have appointed an additional officer at the large salary of 1,500*l.* per annum, whose first act has been to continue the old system of partial and objectionable drainage.—That they had looked forward to the present commission as a guarantee against any further outlay of the rates in new works until the great object sought by the public was decided upon."

MORE IRON HOUSES FOR CALIFORNIA.—Mr. E. T. Bellhouse, of Manchester, who seems to do all the *ironing* for that gold-*washing* region, where *mangling*, too, is not unknown, has just now completed two more iron houses for California. The frame-work and sides are made of iron, corrugated in order to impart to them additional strength. One of the houses consists only of a single story, containing a sitting and bed-room. The walls, floor, and ceiling are boarded entirely over, and the interior thus possesses an air of comfort. The sitting-room measures 11 feet by 6, and is 8 feet 3 inches in height. It is furnished with a stove of an improved description. The value of this house is 90*l.* The second house is of two stories, and contains, altogether, eight rooms,—three parlours, and a kitchen below, and four bed-rooms. Each of the two front parlours (one being on either side of the door) is 12 feet square; while the two back rooms measure 12 feet by 10, the height being proportionate. The bed-rooms are exactly the same size as the lower apartments, with the exception of one, which, extending over the lobby, measures 14 feet by 12. The sides, floors, and ceilings, like those of the first house, are boarded and painted. The value of the latter house is 460*l.*

THE MASONRY OF THE BRITANNIA-BRIDGE.—At an entertainment given on the day the tubular bridge was opened, Mr. Stephenson mentioned incidentally that there had been 3 cubic feet erected per minute for twelve hours each day, six days per week, for three successive years.

NEW HOUSE OF COMMONS.—The sum required for the completion of such portions of the New House of Commons as are necessary for the convenient transaction of business is estimated by Mr. Barry, in a statement recently issued, at 102,180*l.*

RAILWAY JOTTINGS.—"I know," says Mr. Glyn, the highest authority in one of the most important railway lines in existence, "that many Railway Companies have Bills before Parliament, which are based on the *supposition that the mere raising of fares will lead to a restoration of prosperity*. Of course, if any raising of fares should take place, we shall participate in it; but upon the facts and the figures which are before us, excepting those which have reference to the express trains, I am prepared to say, that if we had in our own hands at this moment the power of increasing the fares,—the facts and the figures showing a falling off in the receipts for first and second-class passengers, have, I say, led me to the conclusion that we should by that means *only diminish the number of travellers* in those classes." It is gratifying to find one's own confident predictions now corroborated and confirmed by such an authority. We hope the eyes of others of influence in the railway kingdom will now be also opened to the doubtfulness of such a way of mending matters.——"The stations on the Lancashire and Yorkshire, which are very numerous, entail an expense on the Company," says *Herepath*, "equal to 2d. per passenger. The expense on the London and North-Western is also very great, and hence the observation of Mr. Glyn, that a small booking fee might save the advance of fares. If this be done, it should be in proportion to the distance, or it would fall very unequally on long and short passengers."——Gigantic railway bridges are about to be thrown over the Rhine at Dusseldorf and Cologne; and foreigners, it is said, will be invited to send in contracts for them.

GAS IN GUERNSEY.—As most of our readers may remember, gas was till lately charged in Guernsey at the really quite unsaleable price of 12s. per 1,000 cubic feet, and the *consequence* was, that, in a locality possessing a town parish population of 16,000 to 17,000, gas was so expensive a luxury that not even the streets were lighted, and that the shopkeepers even, with pipes and apparatus for it up in their premises, could only afford to light their shops with it on a Saturday evening! A spirited gas manufacturer, one would have thought, might have had very little difficulty in finding out the real *reason* why his sale, and hence his profit, was so limited. In the present instance, however, not even the constant grumbling of the few consumers, and the many would-be consumers, who desired to purchase and to use it largely,—not even the remonstrances of the *Guernsey Sun* and other authorities, seconded by our own humble endeavour, could fully open the eyes of the virtual darkener of the streets, and shops, and houses of St. Peter's Port to his own best interests: true, with a glimmering of returning light he at length saw the necessity of admitting himself to be in the wrong, by granting a stingy instalment of reduction; but the patience of those who are waiting for light in his little dominion is exhausted, and at length the oft-threatened blow is struck. A new company is formed, and "opposition will be useless on his part, as almost all the gas consumers are shareholders." It is even "now a chance if he do not lose the two islands Guernsey and Jersey both." It is really a thousand pities that one who is seeking, we presume, his own profit in manufacture, should be so blind to his own best interest, and so unwilling to be led, even blindly, into that interest. If not *trop tard*, as his late supporters may now regard it, we would earnestly advise a liberal compromise, after carefully studying the instructive lesson to be learnt in the Gas Returns, by manufacturers themselves, to Parliament.

FREEMASONS OF THE CHURCH.—At a meeting of this association, held on the 12th inst., some strong resolutions were passed expressive of concurrence with the intended Exhibition of 1851. Sir Walter James, Bart., afterwards read a paper on "The Use and Abuse of the Imaginative Faculty, with reference to the Fine Arts." Some interesting specimens of ancient art were exhibited.

THE EXHIBITION OF MEDIÆVAL ART, about to be opened at the Society of Arts, is of the most interesting kind, and cannot fail to exercise a good influence on the minds of those skilled artizans who will visit it.

THE PANOPTICON OF SCIENCE AND ART.—Some of our readers have asked for information concerning this proposed institution. The principal object the parties who originated the Panopticon have in view, is said to be, to extract intellectual profit from pleasure, by bringing forward on a grand scale, before the public, the principal discoveries in the arts, and showing, practically, the various processes of science now, to the million, a mystery. They wish, too, to make these things serve for other purposes than a mere show. They would have them put forward in a way such as would attract by the pleasure that the mere exhibition would give, apart from the intellectual good that might result; but so to arrange these exhibitions that instruction might succeed to vague curiosity,—that those who come, perhaps, but to while away an hour, might be led to think that the study of nature's wonders might be a more instructive, as well as better occupation, than the accustomed pursuit of idle pleasures. They propose, also, to offer to those who wish to make science a recreation, but are prevented by the expense, a place where the best instruction and the greatest command of apparatus can be secured at a moderate price. To carry out these main objects, and many others secondary, to which the prospectus alludes, it will be necessary to have a building, apparatus, &c., on a great scale, and with such means of putting forward the various experiments and exhibitions as will let the institution vie in its attractive powers with the great places of amusement now open,—to let the building be of that magnitude and grandeur which shall remove all idea of the show-room and bazaar, whilst every part of its construction and details shall show the result of some modern invention or improvement. Whether or not this will be done is yet to be seen. Messrs. Finden and Lewis are the architects employed, and we understand their plans are nearly ready.

IRON ROOF, LIME-STREET STATION.—The iron roof of the Lime-street Railway Station, Liverpool, mentioned by us some time ago, was described by Mr. Turner at the Institution of Civil Engineers, on the 19th ultimo. The area covered is 374 feet in length, and 153 feet 6 inches in breadth, which is roofed over in one span. The roof consists of a series of segmental girders or principals, fixed at intervals of 21 feet 6 inches from centre to centre; these are supported, on one side, upon the walls of the offices, as far as they extend, and on the other upon cast-iron columns. From the end of the offices to the viaduct over Hotham-street, a distance of 60 feet 4 inches, the principals are carried upon a "box beam" of wrought-iron. The principals are trussed vertically, by a series of radiating struts, which are made to act upon them by straining the tie-rods and diagonal braces; they are trussed laterally by purlins and by diagonal bracing, extending from the bottom of the radiating struts to the top of the corresponding strut in the adjoining girder; these braces are connected with linking-plates by a bar of the same scantling, and also with the purlins already referred to. The girders are thus firmly knitted together, and a rigid framework formed, upon which the covering of galvanized corrugated iron and glass is laid. We may find an opportunity to describe this roof more in detail.

OXFORD ARCHITECTURAL SOCIETY MEETING, MARCH 6.—Mr. John Buckler was elected an honorary member of the society. Mr. Lechmere, B.A., corresponding secretary, read the report, which stated that the plans of Eye Church, Hertfordshire, had been sent for the inspection of the Committee, who had made observations, and given directions to the secretary to communicate them to the rector. After alluding to other matters, the report concluded with an exhortation to the members of the society to use their best endeavours in furthering the principles of church architecture and church arrangement, and to devote a portion of their time during the ensuing vacation to a study so important, more especially to those about to enter holy orders. The Rev. T. Chamberlain, M.A., then read a paper upon "The Structure and Arrangement of Chancels best suited for the services of the Church."

MR. J. P. DEERING, R.A., better known in his architectural capacity as John Peter Gandy, died on the 2nd inst. We will take an opportunity to furnish some particulars of his life.

THE PRINTING-PRESSES OF THE "TIMES" EXCELLED.—A new machine, it is said, has been exhibited at Paris, that promises to throw even the *Times'* presses into shade. It consists, as described, of a series of lateral cylinders, in little more than half the space of the machine with which the *Patrie* is printed, costs less than half, and is free from its cords and tapes. Each machine requires only three men. The printing is from stereotype, and one machine throws off 15,000 copies an hour. Each cylinder carries a continuous sheet equal to 2,000 copies of a journal, and each copy is cut off by the machine and folded. The stereotyping is a work of fifteen minutes! A few sheets of tissue paper are placed together, and pressed on the face of the types: this is the mould: the metal is poured on it, and the stereotypes are ready. The total cost of one machine is 25,000 francs.

ST. PHILIP'S CHURCH, BIRMINGHAM.—The following tenders have been received for reseating St. Philip's Church, Birmingham. The quantities were furnished by the architect, Mr. C. W. Orford:—

Branson and Co.	£864
Smith	625
Kendrick	591
Briggs (accepted)	530

The whole of the seating is to be of oak, with standard ends and low doors,—the old pulpit and desk are to be abandoned, and new ones, each side of the aisle, substituted. It is believed that these alterations in the interior will end in the complete restoration of this church, on its exterior likewise.

WORKSOP.—NEW SURVEY AND VALUATION.—The guardians have appointed two surveyors to make the required new survey and valuation of the town and parish of Worksop, viz., Mr. Wilmot, late steward to the Duke of Newcastle, as the valuer, and Mr. Robert Watkins as surveyor. Mr. Wilmot's tender was 150*l.*, and Mr. Watkins' 125*l.* The Board had received thirty-seven tenders, varying in amount from 70*l.* to 1,100*l.*

ARCHITECTURAL BEAUTY.—Of what avail is it that the architect studies to produce objects for the admiration of all lovers of the noble and beautiful in architecture, if the fruits of his labours are to be defaced and spoiled by the negligence or want of taste of those to whose care his works are ultimately confided? I am led to put this query by observing to-day, at St. Margaret's, Westminster, another instance of what I have frequently seen with regret, viz., volumes of dense smoke, highly charged with carbonaceous matter, issuing from huge, ugly stove pipes that may be seen projecting either through the roof or out of the windows of many really very fine specimens of the architectonic genius of our countrymen; blackening and defacing them by the consequent deposits of soot. Really in this age of invention, when improved smoke-consuming stoves of every possible variety of form are almost daily ushered into existence, it is an almost unpardonable offence against architectural propriety, that a stove pipe is anywhere to be found rearing its sooty head amidst the rich embellishments of a fine old pile of building. That stoves are indispensable I am not prepared to deny; but why not use those that consume coke, charcoal, or gas, the vapour from which is invisible? Their flues would neither be unsightly when in use, nor would they scatter their grimy and indelible traces around them. J. T.

BUILDINGS AND MONUMENTS,
MODERN AND MEDIÆVAL;
Being Illustrations of the Edifices of the Nineteenth Century, and of some of the Architectural Works of the Middle Ages.
Edited by GEO. GODWIN, F.R.S.,
Fellow of the Institute of Architects; Corresponding Member of several Societies.

Part VI. of this work, price 2s. 6d., is now ready, containing Views of the Great Hall at the Euston Station of the London and North-Western Railway; the General Meeting-room at the same; the Mansion of H. T. Hope, Esq., M.P., Piccadilly; St. Barnabas's College, Queen-street, Pimlico; Romsey Abbey Church; the London Coal Exchange, Lower Thames-street; the House of Francis I., Champs Elysées, Paris; the Hotel Lacarriere, Paris; Font in the Madeleine, Paris: with descriptive Letter-press, and Details.

Part VII. will be published May 1, and Part VIII. will complete the work. To prevent disappointment, the names of parties intending to take the work when completed should be sent forthwith.

Published at the Office of "The Builder," 2, York-street, Covent Garden, or by order of any Bookseller.

MEETINGS OF SCIENTIFIC BODIES

To be held during the ensuing week.

MONDAY, March 18.—Institute of British Architects, 8 p.m.

TUESDAY, March 19.—Institution of Civil Engineers, 8 p.m.

THURSDAY, March 21.—Society of Antiquaries, 8 p.m.; Royal Society, 8½ p.m.

TO CORRESPONDENTS.

"Inquirer" (we know nothing better than the *Camera*), "J. W.," Dublin (it is contrary to custom to furnish the names of correspondents), "J. T." (shall have attention), "W. B.," "R. R." (give us the names of painter and engraver), "T. M. G.," "J. N.," "W. R." (we are unable to comply), "S. R." (the number was duly posted), "J. D. W." (declined with many thanks), "J. M." (drawing shall be returned), "J. F." (request shall be attended to), "R. B." (subject is good: but the drawing is not sufficient for the purpose), "A Competitor," "J. H. P.," "F. H. W.," "J. W." (shall appear), "W. H. M.," "J. S. M.," "C." "An Inquiry into the Chronological Succession of the Styles or Romanesque and Pointed Architecture in France," by Thomas Inkersley (London, John Murray, 1850): "Architectural Publication Society," Part III., 1849-50, Text.

"*Books and Addresses.*"—We have not time to point out books or find addresses.

NOTICE.—All communications respecting *advertisements* should be addressed to the "Publisher," and not to the "Editor:" all other communications should be addressed to the EDITOR, and *not* to the Publisher.

ADVERTISEMENTS.

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"Westminster, May 16th, 1848.

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"CHARLES BARRY."

Messrs. Taylor, Williams, and Jordan."

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(Signed) JNO. WALLEN, Architect, London.

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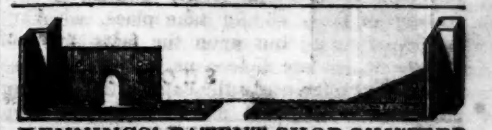

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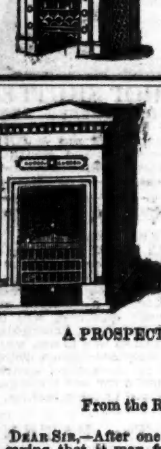

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TESTIMONIALS.

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Winchmore Hill, October 23rd, 1848.

DEAR SIR,—After one winter's experience of your stove in St. Paul's Chapel, I feel no hesitation in saying that it may fairly claim a place in the first rank, among the inventions for warming churches. Before adopting your stove, I made extensive inquiries, both as to the different kinds of stoves in use, and also as to the hot-water system. Inconveniences of one kind or other I found practically experienced under the various systems which I witnessed; but I really have not one inconvenience or objection to allege against your stove. I believe it to be more powerful than any other stove of the same dimensions and expense; and it is far more agreeable in a church than any other with which I am acquainted.—I remain, dear Sir, yours truly,

J. D. FROST.

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I am, Sir, your faithful and much obliged servant,

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*** Complete price lists forwarded on application.

GLASS TILES and SLATES.

SIZE.	ROUGH PLATE. ¼ in. thick.	¾ in. thick.	½ in. thick.	¾ in. thick.	SHEET. 16 oz.	21 oz.	26 oz.	32 oz.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
24 by 12	1 6	2 0	2 8	5 0	0 11	1 3	1 9	2 0
20 by 14	1 5½	1 11	2 7	4 10	0 10½	1 2½	1 8½	1 11
22 by 12	1 5	1 10	2 6	4 8	0 10	1 2	1 8	1 10
20 by 10	1 1½	1 6	2 0	3 8	0 8½	1 0	1 5	1 6
18 by 10	1 1	1 4	1 10	3 4	0 8	0 11	1 3	1 4
16 by 10	1 0	1 3	1 7	3 0	0 7½	0 10	1 2	1 3
16 by 8	0 10	1 1	1 5	2 6	0 7	0 9	1 0	1 1
13 by 7	0 8	0 10	1 2	2 3	0 6	0 7	0 9	0 10

ROUGH PLATE TILES.	s. d.
¼ in. thick, each	0 10
½ " "	1 3
¾ " "	1 7
1 " "	2 0

SHEET TILES.	s. d.
16 oz., each	0 8
21 "	0 10
26 "	1 0
32 "	1 4

Rough Plate Glass from ¼ to 3 inches in thickness. Glass of every description.—JAMES PHILLIPS and CO., 116, Bishopsgate-street, Without, London.

HURWOOD'S PATENT APPARATUS

for MOVING and FASTENING WINDOWS, &c.

GENERAL DESCRIPTION.—This invention recommends itself in all its applications by its simplicity, efficiency, and certainty of action, and entirely dispenses with all pulleys, weights, cords, springs, sash-pegs, fastenings, &c. A principal feature in the invention is the application of the screw, or worm working into a wheel or rack, as a prime mover. The apparatus moves with ease and certainty; is very durable, not likely to be out of order; is perfectly secure in every position, and is applicable to conservatories, French casements, folding-shutters, stables, ventilators, skylights, ship scuttles, deck and stern lights, and to all descriptions of windows, and is particularly adapted to public buildings, where security is an important object, as in lunatic asylums.

Further particulars may be had upon application to the Patentee, and also the terms upon which licenses are granted.

*** Illustrative Catalogues may also be obtained from the Patentee, Ipswich, by inclosing twelve stamps, to cover postage.

CHAS. WM. WATERLOW,

MANUFACTURER

of Sashes and Frames, and Joiner to the Trade, 121, Bunhill-row, Finsbury-square.—Well-seasoned materials, superior workmanship, lowest prices.—Upwards of 400 DOORS, and a large variety of Sashes and Frames, always on sale. Glazed goods securely packed for the country. Steam-struck Mouldings in any quantity.—N.B. This Establishment is worth the notice of all engaged in building.

NOTICE OF REMOVAL.—JOHNSON

and PASK, Sash, Shop Front, and Door Makers to the Trade, beg to inform their Customers and the Public generally, that they have removed to more extensive premises, in

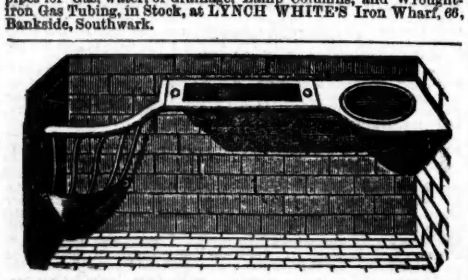
BAKER-STREET, BAGNIGGE WELLS-ROAD;

where they have convenience for carrying on a larger business.

N.B. By inclosing a postage stamp, a full list of prices may be had by return of post.

BUILDERS' CASTINGS at REDUCED

PRICES.—Rain-water Pipes and Gutters (half-round and O G), Sash-weights, Air Bricks, &c., Drain Gratings; also, Socket-pipes for Gas, water, or drainage, Lamp Columns, and Wrought-iron Gas Tubing, in Stock, at LYNCH WHITE'S Iron Wharf, 66, Bankside, Southwark.



SAMUEL HOOD and Co., Castings Ware-

house, 81, Upper Thames-street. REGISTERED STABLE FITTINGS. Enamelled Mangers, with double hay-racks, or with enamelled water-cistern on one side.—Also, girders, columns, hot water pipes, rain water pipes, eaves, gutters, sash weights, &c., at the lowest prices.

WARD and CO., Honduras Wharf, Bank-

side, London.—FIRE BRICKS, 80s. per 1,000, STOCKS, (Cowley) very prime, 35s., Kent, 34s., superior white Suffolk, Dutch clinkers (improved make), patent malt, kiln, and corn-drying tiles. Country pan, plain, paving, 12-inch and 9-inch; Windsor (P) and other oven tiles. CROWN and CIRCULAR bricks, fire lumps, tiles, shield guards, retorts, shaped goods, &c. &c. &c. Clays, loam, concrete, gravel, river sand. Rough above-bridge ditto for plasterers. House ditto red and white. Dorking lime, cement, sanitary pipes, &c. A large stock of Stourbridge, Welsh, and Newcastle square and other Fire Bricks. Pattern Goods with promptness.—COALS: very best screened (fetched), 23s. 6d.; small ditto, 10s. 6d. per ton.

Discount for cash.

BRICKS.—In consequence of the low price

at which Brickmakers have, for some time past, been purchasing Ashes and Breeze, H. DODD is enabled to offer his bricks, which are of good quality, at the following low prices; and as his fields are only a quarter of an hour's walk from the City, H. D. earnestly requests purchasers will favour him with a visit, in order to inspect his stock and to judge for themselves.

Marle Cutters	80s. per thousand.
Yellow Seconds	80s. 6d. "
Pale Seconds	50s. "
Paviors	42s. "
Pickings	38s. "

Marle Place, Half-washed Stocks, and Place Bricks, at equally low prices. These bricks are sound, well burnt, and unusually free from defects; a very large proportion of the Stocks being suitable for external facing. They will be delivered at the above prices anywhere within two miles of the fields.

Apply to HENRY DODD and Co., at the Counting-house, Hoxton Brickfields, Grange-walk, near the Rosemary Branch, Hoxton.

N.B. Red Pit Sand, of approved quality, constantly on sale, upon reasonable terms. In the erection of walls, where it is desirable that the work should be kept as free from damp as possible, this sand, from its not containing any saline matter, is asked to be preferable to river sand.

LIGHTERAGE.—To Saw-Mill Proprietors,

Timber, Slate, and Stone Merchants, or others, requiring Lighterage.—The Advertiser having a large number of Barges, is willing to undertake LIGHTERAGE at prices that defy competition.—Address, CHARLES STRUTTON, 34, Commercial-road, Lambeth; and Trinity-street, Lower Rotherhithe.

DAY'S PATENT WIND-GUARD.—

Thousands of smoky chimneys have been cured by simply applying at the top of the chimney this unequalled, useful, and well-tested invention.—May be had as usual of the manufacturer and sole proprietor, CHAS. W. WHITE, at the Manufactory for the same, Patent Ventilating Works, Commercial-road, Pimlico; and of C. and J. P. GARNERS, 77, Queen-street, Cheapside.

SMOKY CHIMNEYS.—

"NO CURE NO PAY."

J. WILSON, Bricklayer and Surveyor of Chimneys, 1, Vale-place, Hammersmith, begs to inform architects, surveyors, builders, and others, that he can guarantee a perfect cure of chimneys from smoking into rooms, and on the equitable terms of "No cure no pay." References and testimonials of the highest respectability can be given.

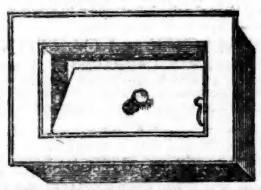
N.B. WILSON & Co.'s PATENT CHIMNEY POTS for the Cure of Smoky Chimneys, which have been extensively tested for the last four years, can be forwarded to any part of the Kingdom on receipt of a Post-office order. Prices and prospectuses by return of post. Licenses granted to manufacturers.

MANUFACTORY—VALE-PLACE, HAMMERSMITH, MIDDLESEX.

DR. ARNOTT'S VENTILATING

CHIMNEY VALVE,

With internal movement, and all the latest improvements.



Constructed for the ventilation of apartments generally.

REDUCED LIST OF PRICES—SUBJECT TO THE TRADE DISCOUNT.

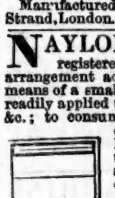
	First size, 11 by 8.	Second size, 16 by 9
Plain Iron Valve	6 0	9 6
Bronzed and Leathered	7 0	10 6
Japanned, white with Gold lines	11 6	16 6
Ditto with Trellis-work	17 0	25 0
Brass Front, lacqd. or bronzed	13 6	19 6
Ditto with Trellis work	19 0	27 0

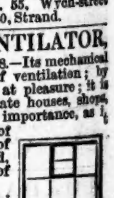
Ventilators of any description made to order.

Manufactured by HART and SONS, 53, 54, 55, Wych-street Strand, London.—Post-office orders payable at 180, Strand.

NAYLOR'S New GLASS VENTILATOR,

registered 20th November, 1849, No. 2088.—Its mechanical arrangement admits of the largest amount of ventilation; by means of a small lever it can be opened or shut at pleasure; it is readily applied to the windows of churches, private houses, shops, &c.; to consumers of gas it is of paramount importance, as it effectually allows the egress of heated air, and the admission of the fresh air; it is easily cleaned, and not liable to be put out of order.

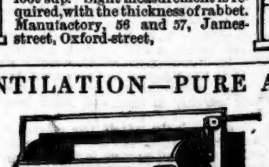




Price 20s. each under 1 foot sup.; from 1 foot to 2 feet sup., at the same rate; above 2 feet, 18s. per foot sup. Sight measurement is required, with the thickness of rabbet. Manufactory, 56 and 57, James-street, Oxford-street.

VENTILATION—PURE AIR.

Sheringham's Ventilator, for the admission of pure air through an



EXTERNAL WALL.

With single pully, from 6s. each; with leading pully, from 8s. 6d.

These Ventilators are so arranged that the requisite quantity of air may be admitted for the due ventilation of an apartment without the slightest draught being felt by the occupants; and as they are placed in the external wall, their action is not impeded when the house is closed for the evening, at which time a constant supply of fresh air is most required.—HAYWARD, BROTHERS, sole Manufacturers, 196, Blackfriars-road, and 117, Union-street Borough; and of all respectable ironmongers, builders, &c.